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Threshold concepts in research and
evidence-based practice: investigating
troublesome learning for undergraduate
nursing students

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Abstract

Across healthcare, evidence-based practice (EBP) has been recognised as a core component of providing safe and effective patient care and, consequently, research and EBP are important components of the undergraduate nursing curriculum. Despite the attention given to research and EBP in nursing education literature, the evidence base for effective learning and teaching strategies is weak. There is also evidence that undergraduate nursing students find aspects of these topics difficult and that negative attitudes may be a barrier to learning. However, little is known about the detail and processes of learning in this area.

This narrative research study investigated the difficulties that nursing students encountered in learning about research and EBP and explored changes and transformations in their understanding. Using threshold concepts as a theoretical framework, the study aimed to identify thresholds associated with research and EBP, in the context of undergraduate nursing education. Seventeen third year students, from a large school of nursing, took part in at least one unstructured narrative interview and 13 of these gave two interviews, at the beginning and end of a research and EBP module. The interviews explored learning during the module, as well as students' experiences in the first two years of their study. This included learning in practice and university settings.

The findings show that the learning environments were characterised by variability and complexity. Students encountered different sources of trouble in their learning and they demonstrated varying degrees of change and transformation, which also linked to their developing nursing identity. From the narratives, a set of academic thresholds concepts emerged that underpins acquisition of a professional threshold of evidence-based thinking and practising. These findings have implications for undergraduate nursing curricula and suggest that there are changes required in education and practice settings, for EBP to be embedded in nursing practice and identity.

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Abbreviations

ATR	Attitude Towards Research Scale
BN	Bachelor of Nursing
CEBP	Community of Evidence-Based Practice
CoP	Community of Practice
CPD	Continuing Professional Development
EBP	Evidence-Based Practice
ECTS	European Credit Transfer and Accumulation System
FHEQ	Framework for Higher Education Qualifications in England
HE	Higher Education
HNC	Higher National Certificate
KAB	Knowledge Attitudes and Behaviours
LPP	Legitimate Peripheral Participation
LTF	Learning Team Facilitator
MKO	Most Knowledgeable Other
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NMC	Nursing and Midwifery Council
OT	Occupational Therapy
RCN	Royal College of Nursing
SCQF	Scottish Credit and Qualifications Framework
SIGN	Scottish Intercollegiate Guidelines Network)
VLE	Virtual Learning Environment
WTP	Ways of Thinking and Practising
VLE	Virtual Learning Environment
ZPD	Zone of Proximal Development

Declaration and statement of copyright

This thesis is the result of my own work and has not been previously offered in candidature for a degree at this or any other institution.

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*“Study lends a kind of enchantment
to all our surroundings”*

Honoré de Balzac
La Peau de Chagrin (The Wild Ass's Skin),
1831

Chapter 1: Introduction and Background

1.1 The starting point: evidence-based practice in healthcare

This thesis has its beginnings in one of the driving forces of contemporary healthcare systems – to provide high quality and effective patient care based on the best available evidence (The Cochrane Collaboration, 2014). This approach, known as evidence-based practice (EBP), aims to support clinical decision making, by applying research evidence along with professional judgement, other relevant evidence and the wishes and needs of patients (Scott & McSherry, 2009). It follows that nurses need to be able to evaluate information and make rational, evidence-based decisions to deliver effective care.

EBP has increasingly been acknowledged as the basis for best practice in healthcare and in a seminal article over 20 years ago, it was argued that using evidence to inform and guide practice represented a new way of working in healthcare (Evidence-Based Medicine Working Group, 1992). The EBP movement has its roots in medicine and a commonly used definition of evidence-based medicine was given by Sackett, Straus, Richardson, Rosenberg, and Haynes (2000) as “the integration of best research evidence with clinical expertise and patient values” (p1). This definition remains widely cited, although the more generic “practice” has often replaced “medicine”, as EBP has been integrated into other healthcare professions. The definition captures the need to apply research

evidence to the practice setting and situation, while taking into account the patient's needs and values and the clinician's own expertise and experience.

Over the past 20 years EBP has become embedded into nursing, so nurses are expected to integrate relevant and reliable evidence into their professional practice (Ciliska, 2006). The importance of EBP is demonstrated by healthcare regulatory bodies around the world, which specify that healthcare practice needs to be evidence-based. Notably, in the case of UK nurses, *The Code: Standards of conduct, performance and ethics for nurses and midwives* (Nursing and Midwifery Council, 2008a)¹ stipulates that nurses and midwives must “use the best available evidence” (p4). This illustrates how nursing has embraced EBP as an essential component of providing best nursing practice. However, the challenges associated with integrating EBP into everyday practice are well reported and these include factors associated with lack of knowledge and education (Kajermo et al., 2010). This means that nursing education has a role and responsibility in preparing students for being evidence-based in their professional practice. Focusing on this aspect of EBP, this thesis explores aspects of how students prepare for becoming evidence-based practitioners, as part of providing effective patient care.

¹ The revised Code was due for publication just as this thesis was being completed. The publicly available draft version of the revised Code continues to expect registered nurses to use evidence in their practice and is available at:
<http://www.nmc-uk.org/Documents/Consultations/2014/Draft-revised-code.pdf>

1.2 Research problem and aims of the study

The widespread acceptance of EBP within nursing has resulted in EBP becoming an important aspect of the undergraduate curriculum, along with research skills and methods (LoBiondo-Wood & Haber, 2014)². This means that undergraduate nursing education needs to grow thinking professionals who can evaluate different types of evidence and information, using this to provide patient-centred care. To achieve this, students are routinely taught a range of skills associated with research and EBP, including critical thinking, information handling and research methods (Irvine et al., 2008). However, these academic subjects appear to be problematic for students and the perceived difficulties and challenges associated with research and EBP provided the rationale for the research study that this thesis reports.

Initially, the study was prompted by anecdotal observations that students at both undergraduate and postgraduate levels seemed to find research and EBP learning particularly challenging. This applied to their perceptions of how difficult research skills and methods might be, before starting formal study of research and also carried forward to experiences of difficulty while studying research. In addition to this, they seemed to be challenged by critical appraisal and literature searching, skills that are strongly linked to both research and EBP. One memorable online discussion started with a student who said that she was finding a research module challenging and felt completely overwhelmed. This seemed to

² The relationship between research and EBP is discussed further in section 1.4.1.

open the floodgates to a torrent of similar comments from her peers. Although some students appeared to reach the end of a research and EBP module having acquired a range of research skills and an understanding of EBP, others worryingly seemed to have their negative views of research reinforced.

This potentially presents a significant problem because, as already noted, research and EBP are widely agreed to be an essential part of the nursing curriculum. Added to this anecdotal evidence, many studies of research utilisation and EBP in healthcare, such as Rudman, Gustavsson, Ehrenberg, Boström, and Wallin (2012), have shown that there is poor transfer of research based evidence into practice. Although some of the reasons for this are organisational, lack of educational preparation for using evidence in practice is known to be a contributing factor, so undergraduate nursing education has a role to play in ensuring that students are prepared for EBP (Christie, Hamill, & Power, 2012).

A premise of this study is that it is not good enough to provide an educational experience in research and EBP that has positive results for some, or even most students. All students need to have a positive learning experience and to learn enough about these topics to enable them to become evidence-based practitioners. This rationale is partly justified because of the educational need to ensure that such an important topic for nurses is learned by all students, but it also relates to the mandated requirements for nurses to hold at least the basic competencies for EBP

on registration (Nursing and Midwifery Council, 2008a). Many research studies and evaluation reports have found positive outcomes of teaching interventions for a sizable percentage of students, such as McCurry and Martins (2010) and Kim, Brown, Fields, and Stichler (2009), but there is a need to understand the learning experiences of students who do not achieve learning objectives, as well as those who do.

Although research and EBP are important and common features of nursing education at all educational levels, undergraduate education was identified as the focus because of the Nursing and Midwifery Council (NMC) stipulation that all registered nurses should use evidence to support practice (Nursing and Midwifery Council, 2008a). The difficulties and challenges that undergraduate students encounter were chosen as a particular area of interest because of the anecdotal evidence noted above, as well as the need for educators to help students to overcome problems and difficulties. Understanding the problems students encounter can help those involved in higher education (HE) to provide more effective teaching and support (Perkins, 2006). Additionally, complementing the study's focus on difficulty was an examination of how students managed to get over challenges and achieve learning that changed or transformed their understanding.

Within the context described, the study had two key aims:

- To explore the difficulties encountered by undergraduate nursing students in learning about research and EBP
- To identify any approaches to learning that led to transformed understanding of research and EBP.

In devising the study based on these aims, it was important to understand the background of research and EBP education within nursing education and to understand the pre-registration (or undergraduate) nursing curriculum, given that this has seen two periods of significant change over the past two decades, in the UK and elsewhere around the world.

1.3 Undergraduate nursing education in the UK

Traditionally, nurses were trained in healthcare settings supported by local colleges of nursing and this apprenticeship model was the main route to nursing registration in the UK until the 1990s (Meerabeau, 2001). Practice was largely passed from more experienced nurses to trainees, with little attention to evidence and potential for poor practice to be passed down during training (Willis Commission on Nursing Education, 2012). However, this model was not consistent with the demands of modern healthcare and during the 1990s nursing education changed fundamentally in the UK, when all programmes moved into HE (Willis Commission on Nursing Education, 2012). This move reflected the desire to establish nursing as an academic discipline and to professionalise nursing, mirroring similar changes in other developed countries. Associated with this change was the need for academic and professional skills such as reflection, critical

thinking, self-direction and clinical decision-making (Farrand, McMullan, Jowett, & Humphreys, 2006). Along with these, the Project 2000 report by the United Kingdom Central Council for Nursing Midwifery and Health Visiting (1986) identified other healthcare-based considerations that provided drivers for change, including the increasing specialisation in healthcare, poor learning opportunities for students in the apprenticeship model and inefficiencies associated with having trainee nurses as part of the workforce. Although there had been resistance to such change, the 1990s completed the move of nursing education into HE, with nursing students becoming supernumerary while in practice placements (Burke, 2006; Hallett, 1997).

In the new university based programmes nursing students initially undertook HE diploma level study that also led to nursing registration. Although there was often an option to complete additional modules and graduate with a degree (as was the case in the university in which this research study was carried out), diploma level study was sufficient to become a registered nurse (Burke, 2006). The need for nurses to be educated to degree level was propelled by the increasingly complex nature of healthcare and anticipated requirements for nurses to provide care for people with a wide range of needs and medical conditions and across diverse settings (Nursing and Midwifery Council, 2010). Specifically it was recognised that nurses need to use evidence to support decision-making in practice (Nursing and Midwifery Council, 2010).

To adapt to these needs, nursing education has changed again in the UK, in common with many other countries. Students starting their initial nursing education, after 2011 in Scotland and 2013 in England, must gain a degree to be admitted to the nursing register (Nursing and Midwifery Council, 2010). Traditionally, nursing students have been referred to as pre-registration students, because they are in the process of their initial nursing training, but as the shift to degree-only registration is completed, pre-registration and undergraduate have become synonymous, with both now referring to students who are in a bachelor's degree programme, that will lead to registration as a nurse.

Student nurses in the UK typically study for three years in programmes that are divided evenly between practice and university based learning, as stipulated by European law (European Parliament and the Council of the European Union, 2005). Although some elements of the curriculum are common to all student nurses, they specialise from the outset, being admitted to one of four fields: adult, children's, mental health or learning disability. During their time in practice, students will normally experience a range of settings, including both acute (hospital based) and community placements. Placements vary in length, but are usually around 6-12 weeks long and students are always allocated a mentor in practice, who is a registered nurse with a mentorship qualification (Rooke, 2014). Within this context student nurses are expected to experience EBP "in action" during practice placements, as well as receiving formal instruction in both research and EBP while in the university setting (Ciliska, 2005).

1.4 Research and evidence-based practice in nursing education

1.4.1 Links between research and evidence-based practice

Research and EBP have both been included in the study and although in some sections one is explored in more detail than the other, they have been treated as two parts of a whole. The reason for this lies in the premise of the study that undergraduate nursing students need to be prepared for using evidence in their nursing practice. Research can be explored as a stand-alone topic, when, for example, considering it in the context of doctoral study or how to undertake disciplinary research. EBP education cannot be studied alone in the same way, because knowledge and understanding of EBP is built on at least a basic understanding of the research process and research terminology. This made it important to consider both research and EBP education in the study. Consequently, through the thesis, both are considered in detail, though at times this is from different perspectives and sometimes they are reviewed separately, depending on the particular aspect of education being discussed.

1.4.2 Research and evidence-based practice in nursing education

The prominence, positioning and approach to research and EBP in the undergraduate nursing curriculum is decided by individual schools of nursing, with an important driver being the requirement for students to use evidence in practice at the point of registration (Nursing and Midwifery

Council, 2008a). Research methods and skills have long been taught across HE and are recognised as part of the undergraduate curriculum in many disciplines, as well as being of fundamental importance in postgraduate programmes (Quality Assurance Agency for Higher Education, 2008). Within nursing education, research methods have been part of some curricula for over 50 years (Wax, 1966). However the advent of EBP in the 1990s, coinciding with the move of nursing education into HE, has led to more debate and focus on the place of research-related skills in undergraduate programmes. The significance of EBP for nursing practice and its wide acceptance as an approach to patient care have led to EBP becoming an important aspect of nursing education (Ciliska, 2005).

The constituent parts of EBP are generally agreed and are often presented as a process based model, such as the Iowa model (Titler et al., 2001). They identify five key stages: defining the problem; finding relevant literature; appraising the literature; planning and implementing change; and evaluating change. Such models identify literature searching and critical appraisal as pre-requisites for applying evidence in practice (Profetto-McGrath, 2005) and these need to be underpinned by knowledge and understanding of a range of research methods, terms and concepts, if students are to become evidence-based practitioners. This relates particularly to critical appraisal, which assumes a degree of knowledge and understanding of research terminology, if students are to be able to evaluate research reports and synthesise the evidence found. Research and EBP appear to be intertwined and becoming an evidence-based

practitioner requires acquisition of the skillset associated with EBP itself, as well as understanding of research terminology and concepts.

This is made more complex, to an extent, because nurses may be expected to understand and evaluate a wide range of quantitative and qualitative research methods and approaches, when assessing research evidence. EBP, with its roots in medicine, has traditionally been strongly associated with positivist research (Mantzoukas, 2008). However, more recently and in nursing particularly, a significant proportion of research evidence generated comes from applied qualitative or descriptive quantitative research that is focused on patient needs and experiences of nursing care (Gerrish & Lacey, 2010). This move acknowledges that a broader spectrum of research evidence is potentially valuable (DiCenso, Cullum, & Ciliska, 1998), but the implication of this is that nurses need to be able to understand widely differing sources of research evidence.

The need to prepare students for EBP means that those involved in undergraduate education have a responsibility to teach these required skills either in practice settings, in the classroom or between these two. This can present a challenge, as basic research concepts and terms need to be included in the curriculum, as well as others more specific to EBP. Alongside this there is also a body of evidence suggesting that both students and practising professionals consistently find research a challenging topic (Alspach, 2006; Ax & Kincade, 2001; Niven, Roy, Schaefer, Gasquoine, & Ward, 2013). Many studies have been carried out

evaluating the effects of different educational tools and approaches on learners' understanding and knowledge of research and EBP, including Estes, Globig, and Selig (2009), Kim et al. (2009), Irvine et al. (2008), Sherriff, Wallis, and Chaboyer (2007) and Schmidt and Brown (2007). Such studies place the emphasis on increasing or improving learners' knowledge, competence or confidence in research skills. However it may be argued that to achieve such aims, there needs to be better understanding of *how* students experience learning about research and EBP, *what* they find problematic or troublesome and *why* they find these topics inherently complex and difficult. This study has focused on these underlying issues and has contributed to understanding how students experience learning about research and EBP. From this knowledge base, consideration has been given to how education might be able to better prepare nursing students for EBP.

1.5 Focus and boundaries of the study

This study was concerned with nursing students and was undertaken as educational research, rather than research in healthcare. This is important because it is educationally based theory, method and thinking that have guided the study, rather than approaches associated with healthcare or nursing. The study also focused exclusively on nursing students in their undergraduate, or pre-registration years. Although it may have been useful and interesting to compare undergraduate nursing students with post-

registration³ or postgraduate students in nursing, this was beyond the scope of the study, so breadth had to be forfeited for the benefit of depth. Undergraduate nurses were the most relevant group to study because of the stated requirement for them to use evidence in practice on registration (Nursing and Midwifery Council, 2008a). Similarly it may have been thought provoking to include students from other healthcare professions, but this was also beyond the scope of the study.

1.6 Other “points of information”

1.6.1 Academic writing style

The thesis has largely been written in the passive voice. In recent years the close association of the passive voice with academic writing has become less obligatory, but using the passive voice remains common in the social sciences and is a good approach for maintaining objectivity. Although the narrative research methodology used in the study is concerned with the subjective views of participants, as well as the role of the researcher, the written thesis still needs to be presented objectively to ensure rigour. To this end, the passive voice has mainly been used. However section 5.7 of chapter 5 has been written in the first person as this includes a reflexive review of the study as well as reflections on personal learning and thresholds encountered while working on the research.

³ Post-registration nursing students are already registered nurses, but they do not have a degree. It is common for nurses in this position to go back to nursing studies part-time, to complete a degree programme. This usually requires 60-120 credits (30-60 ECTS) at level 5 (FHEQ) / level 9 (SCQF).

1.6.2 Anonymising the students

In reporting the findings, all student and staff names have been anonymised, by giving them alternative names. As far as possible, pseudonyms were chosen to reflect the age range and socioeconomic make-up of the student group. Giving pseudonyms, rather than allocating numbers or codes, was felt to be preferable because it helps to maintain the individuality of the students and ground their narratives in real experience.

Throughout the thesis the participants in the study have been referred to as students, rather than learners or participants. This is because their identity as students was particularly important to the study, both in how they learnt in the university as well as how they were regarded in practice settings. The students also invariably referred to themselves as students, so using this term aims to give authenticity to the reporting of the study.

1.6.3 Study context

Students in this study were all undertaking a three year programme of study in a large school of nursing in Scotland. Students were able to exit the programme with a diploma in nursing, which would allow them to be added to the professional nursing register. However they also had the option of completing two additional modules of study in their final year to enable them to exit with a bachelor of nursing degree (BN). These two modules were an introductory research and EBP module, delivered online in the first semester of third year, and a self-directed study module, taken

in the second semester. Since academic year 2011/12, all nursing students in Scotland have been admitted to degree programmes and the option of exiting with a diploma is no longer available. This meant that the option to study the additional modules was attractive to many students who had entered nursing study in the years prior to 2011/12, as it enabled them to be educated to the same level as the students coming just after them⁴. The degree “upgrade” modules had potentially positive implications for career progression and were also offered at no additional cost. Students would be able to complete a degree by undertaking additional modules at a later stage, once they had started working, but these would have to be funded separately.

In the school of nursing that was the setting for the study, students are admitted to adult, mental health or children’s nursing. The school also has two campuses, some distance apart and each campus has its own intakes of students, with classroom teaching taking place in the home campus. Academic staff members are based at one of the campuses, but there is cross-campus teaching and the team for the research and EBP module that was the focus of the study included members from both campuses. During the module students had support from the module leader and their personal tutor. The personal tutor is an academic member of staff who supports students both academically and pastorally throughout their studies. This person is a registered nurse, though not usually active in clinical practice and may not be an expert in research or EBP.

⁴ The students who took part in the study had started their nursing studies between September 2009 and September 2010.

The school used for the study is typical of schools of nursing in the UK and the governance of undergraduate nursing curricula by the NMC means that there is a degree of conformity across such programmes in terms of content, delivery and educational level.

1.7 Presentation of the thesis

The thesis presents the rationale, findings and discussion of the study in six chapters. In the next chapter literature relevant to the study is reviewed.

A search strategy was devised for the literature review that aimed to systematically identify research literature that was directly relevant to the practice issue being investigated. To supplement that, when required, a range of evaluation and discussion literature was accessed, mainly from nursing, but including other healthcare professions too, as appropriate.

The research questions identified were based on the literature review, but also related to the research problem, as discussed in section 1.2 and to threshold concepts, which was the key theory underpinning the research study.

Threshold concepts, as well as other theories and models that have informed the study, are discussed in chapter 3, which is divided into three parts: the theoretical framework; the narrative research methodology; and the research design. These three parts provide the foundations for the research study and although they have each been presented separately, alignment between them has been built in, to ensure that the research questions can be answered fully and that the study is rigorous.

Chapters 4 and 5 lay out the findings of the study followed by discussion of these. Five themes were found and from these four substantive areas for discussion were identified. Chapter 5 – the discussion – addresses two different aspects of the study. Firstly, it analyses the four discussion points arising from the findings and secondly, it considers rigour and personal learning. Rigour is reviewed by using a narrative research quality framework Riessman (2008), as well as a reflexive account of the study, identifying strengths and weaknesses in the study. Reflections on personal learning have been presented using threshold concepts as a framework. This aligned with the study itself, but also provided a very useful way of reflecting on the research experience.

The final chapter draws conclusions from the study, reviewing the research question and how it was answered. Recommendations have been presented from two perspectives: recommendations for practice, including curriculum development and delivery; and recommendations for further research, based mainly on the study but also drawing on other research in this area.

Chapter 2: Literature review

A comprehensive review of literature is an essential component of a research study, to help with developing an in-depth understanding of the topic under investigation and to inform the research process. This includes development of the research questions, choice of methodology and research methods, as well as supporting the discussion of findings (Roberts, 2010). Part of the function of the literature review is therefore to add legitimacy to a research study, by ensuring that the research is needed and can contribute new knowledge to the area of study (Cohen, Manion, & Morrison, 2011).

Since the research literature around research and EBP in nursing education is mostly small scale and heterogeneous, a traditional review was undertaken as this was able to capture the variety of evidence from a range of studies, in terms of types and quality of evidence. Across healthcare and education there has been a move towards systematic reviews, with the setting up of organisations such as the Cochrane Collaboration and the EPPI-Centre (Andrews, 2005). Bettany-Saltikov (2012) suggests that systematic reviews can be useful when there is a need to identify only very high quality evidence, for example when proposing policy change. However the traditional review is better suited for giving a thorough overview of all relevant evidence to underpin a research study (Cronin, Ryan, & Coughlan, 2008).

The literature review aimed to assess what is known about research and EBP education for undergraduate nurses, focusing on research evidence in this area. It included studies in undergraduate nursing education that have explored any aspect of learning and teaching in research and EBP. This review formed the core of topic evidence underpinning the study and three themes emerged from this. These were: the varied nature and scope of research and EBP education; difficulty and challenges; and the impact on learning of research and EBP education. Together they offer an overview of current research evidence and the range of influencers on student learning in this subject area. The themes were derived from a systematic search for research literature and subsequent review of 32 primary research studies and four literature reviews from nursing education literature. A summary of these 36 sources, including key information about methods and findings, can be found in appendix 1.

Initially each article was appraised to identify relevant evidence related to research and EBP learning and teaching. These appraisals were then synthesised into the three themes. Although the review has concentrated on research evidence, there are also many evaluation and discussion papers about research and EBP in nursing and some of these have informed the review. Where these have been used to supplement the discussion, they have been identified to avoid any confusion with the core group of 36 research papers.

2.1 Search strategy

Discovering literature relating to research and EBP education within nursing is complicated, due to the generic nature of these terms. Both “research” and “evidence-based practice” occur frequently in literature searches, even when results are limited to title or abstracts only. Five databases were searched to ensure that both healthcare and education sources were covered. Although this was an educational research study, it was important to include healthcare databases because nursing education research is often published in healthcare and nursing journals. The databases searched were: CINAHL Plus⁵, Medline⁶, ASSIA⁷, Dialog⁸ and ZETOC⁹. The Cochrane Library of systematic reviews¹⁰ was also searched but no reviews meeting the criteria were found. CINAHL Plus and Medline were both searched using controlled vocabularies (CINAHL and MeSH headings respectively) to take advantage of the high reliability that controlled vocabularies offer for identifying relevant and current literature. ASSIA, Dialog and ZETOC were searched using the following key words and terms: education; evidence-based practice; nursing; healthcare; learning; and teaching. These varied according to the database being searched and variants, such as “healthcare” and “health care”, were also included, as well as combinations of key words and terms. Full details of all searches are included in appendix 2.

⁵ CINAHL Plus: the Cumulative Index of Nursing and Allied Health Literature

⁶ Medline: database of the US National Library of Medicine

⁷ ASSIA: the Applied Social Sciences Index and Abstracts

⁸ Dialog: combined search of the British Education Index, ERIC and the Australian Education Index

⁹ ZETOC: the British Library Electronic Table of Contents

¹⁰ The Cochrane Library was searched for evidence from systematic reviews produced by the Cochrane Collaboration and five other associated databases.

Articles were only included if they were about undergraduate nursing programmes, because these are fundamentally different to other levels and types of nursing education. Articles that reviewed undergraduate research and EBP education along with postgraduate education or continuing professional development (CPD) were included. All other healthcare professions were excluded. Searches were limited to 1996 onwards (to June 2014) and to English language publications. The year 1996 was selected because nursing education was integrated into the HE system in the UK by this time and the current model of nursing education was in use, combining both university-based and clinical teaching. Concurrently, the evidence-based medicine movement also gained popularity (Evidence-Based Medicine Working Group, 1992) and prior to 1996 there were very few references to EBP in the nursing literature. All research evidence was included, irrespective of the method employed, but evaluation evidence was excluded.

Initially, 3351 articles were found across all searches undertaken, but after excluding duplicates and articles clearly unsuitable from the title, this was reduced to 959. The abstracts and keywords of these papers were then reviewed and the final number of articles included in the review was 36 (appendix 2). The literature review process also identified a wide range of evaluation and discussion papers, relating to nursing and other healthcare disciplines. Additionally, some seminal articles published before 1996 were identified from the references lists of the articles reviewed. These other papers and seminal articles were used to support the review, as

relevant. The 32 primary research papers were reviewed to identify whether they focused mainly on research or EBP (the other four papers included were literature reviews). The methodology and geographical setting of the studies was also identified and a summary of this is given in tables 2.1 and 2.2 below.

Methodology	Research	Evidence Based Practice	TOTAL
Quantitative	13	12	25
<i>Comprising:</i>			
<i>Cross-sectional survey</i>	5	9	14
<i>Pre- and post-test</i>	7	3	10
<i>Documentary analysis</i>	1	0	1
Qualitative	4	2	6
<i>Comprising:</i>			
<i>Interviews</i>	3	0	3
<i>Focus groups</i>	1	1	2
<i>Survey</i>	0	1	1
Mixed methods	1	0	1
TOTAL	18	14	32

Table 2.1: Research papers by methodology
(excluding literature reviews)

Geographical area	Research	Evidence Based Practice	TOTAL
UK	3	3	6
Europe	1	6	7
The Americas	9	2	11
Far East	4	1	5
Australia & New Zealand	1	2	3
TOTAL	18	14	32

Table 2.2: Research papers by geography
(excluding literature reviews)

There is a reasonably even spread between research and EBP and some papers refer to both. Relatively few qualitative papers were found and all but one of the quantitative papers included are cross-sectional surveys or have a pre- and post-test design, some with a control group. Most studies took place at a single point in time or over the course of a module or semester, though two of the studies were longitudinal, both following students through the three years of their studies (Gray, 2010; MacVicar, 1998).

2.2 Methodological issues

Strengths and weaknesses of individual studies are discussed and referenced through the review. However, some recurrent issues were noticeable when reviewing this body of literature as a whole, including the 36 research articles identified for review. These merit some general discussion, to help to contextualise the review and its findings. Much of the published literature relating to research and EBP in nursing is not research-based. Considering EBP in particular, educators frequently publish their views on the need for EBP and how best to teach it. The paucity of research into EBP education and the need for more research in this area has been noted consistently for around 10 years (Ciliska, 2005; Moch, Cronje, & Branson, 2010; Porter, 2001). This lack of evidence goes beyond nursing to other healthcare professions and is highlighted by the Cochrane Review *Teaching critical appraisal skills in healthcare settings* (Horsley et al., 2011), though the review focuses specifically on the appraisal component of EBP. This systematic review identified three

articles that met their inclusion criteria and all were related to medicine. Additionally, of the 50 articles that were formally assessed, but excluded, only two appeared in nursing journals and one further article related to midwifery, though others may have included nurses in their samples. This systematic review concluded that there remains a need for robust evidence about teaching critical appraisal skills to healthcare professionals, as well as for studies investigating CPD provision relating to EBP. However, these recommendations could usefully have included undergraduate education, given the mandatory requirements across healthcare disciplines for newly qualified healthcare professionals to apply EBP in their practice (General Medical Council, 2009; Nursing and Midwifery Council, 2008a).

The literature search identified a range of evidence from research studies but a relatively small number of rigorous studies. These included some quasi-experimental studies, detailed qualitative work and reviews of different aspects of the topics. Generally, though, the quality of the evidence base is not very strong and is characterised largely by small scale, single centre studies, which usually rely on self-reported data. Despite the limitations of these studies, particularly in terms of generalisability or transferability, the results tend to be similar and report a positive short-term effect of varied educational interventions on students' experience of research and EBP teaching and this will be explored in more detail in the following sections of this chapter.

The cross-sectional survey was the most popular quantitative method used to investigate teaching and learning of research and EBP¹¹. This was often linked to reviewing a module or unit in an undergraduate programme and some researchers developed their own questionnaires.

Complementing the research literature, much of the evaluation evidence reports on routine evaluation work, when pre-existing, but generally unvalidated questionnaires were also used. While the majority of the quantitative research studies were cross-sectional studies, others adopted a pre- and post-test approach, which potentially offers some insight into changes and transformation linked to educational input. These studies focused on outcomes related to how students experienced research or EBP teaching and whether there was an impact following a teaching intervention. However, there is no consistent set of outcomes and in most cases the impact was only measured immediately after the intervention, with no follow-up of longer-term effects. Some of the quantitative studies also collected a small amount of qualitative data, usually in the form of supplementary free-text questions, but this has been mostly disregarded, as it is not reported in detail.

In the related area of research utilisation by nurses, validated tools have been widely used, notably the BARRIERS tool (Funk, Champagne, Wiese, & Tornquist, 1991). A systematic review of studies using the BARRIERS tool in nursing included 63 such studies in the review, from a range of geographical settings (Kajermo et al., 2010). This contrasts with research

¹¹ The methodologies used in each of the 36 papers reviewed are listed in appendix 1

and EBP education for nurses, in which no tool has been widely adopted, although Johnston, Leung, Fielding, Tin, and Ho (2003) developed a Knowledge, Attitudes and Behaviour (KAB) scale for EBP education in undergraduate medicine. This was adapted and used in three of the studies in this review (Brown, Kim, Stichler, & Fields, 2010; Kim et al., 2009; Zhang, Zeng, Chen, & Li, 2012). However, most of the questionnaires used to collect data were developed specifically for the studies and although some were piloted, most had no rigorous validation before use.

Only six studies included in the review had a qualitative methodology. This may reflect the research landscape that is typically made up of practitioner research. Such research is characterised by educators investigating their own practices and reflecting on them, as well as directing their own research activities (Campbell, 2007). Many of the research studies in the review were carried out by educators combining research with their teaching activities and the time required to gather qualitative data may have been a barrier to this type of study. The preponderance of quantitative studies may also reflect the dominance of the positivist paradigm within healthcare, as reflected in the widespread use of hierarchies of evidence that disregard qualitative work (Greenhalgh, 2014; OCEBM Levels of Evidence Working Group, 2011)¹². Whatever the reason, the lack of qualitative work means that there is relatively little evidence

¹² OCEBM Table of Evidence Working Group membership: Jeremy Howick, Iain Chalmers (James Lind Library), Paul Glasziou, Trish Greenhalgh, Carl Heneghan, Alessandro Liberati, Ivan Moschetti, Bob Phillips, Hazel Thornton, Olive Goddard and Mary Hodgkinson

about the varied ways in which students learn about research and EBP, as the quantitative studies tended to focus on what was learnt, or on attitudes towards research and EBP. They also tended to focus on successful or positive factors associated with learning, so challenges and difficulties in learning were not frequently reported.

Generally the research evidence found has quite poor credibility at the level of individual studies, though, considered as a body of evidence, recurrent themes and outcomes have emerged that provide insight to the topic of undergraduate research and EBP education in nursing. There are also a small number of larger scale or more rigorous studies, as well as literature reviews that offer different perspectives and more depth of information, whether qualitative or quantitative. The following three sections present the themes identified in the literature review and some of the methodological issues raised in this section are explored in more detail and in relation to specific studies.

2.3 Variability in research and EBP education

In the first chapter the requirement by regulatory bodies for newly registered nurses to integrate evidence into practice was noted as part of the underpinning rationale for the study. Addressing this in a Journal of Advanced Nursing editorial, Parahoo (2012) questions whether undergraduate nursing education provides adequate and suitable preparation for EBP, though there does appear to be consensus in the literature that the skills and knowledge associated with research and EBP

need to be included in nursing curricula (Callister, Matsumura, Lookinland, Mangum, & Loucks, 2005). Despite this consensus, the nature of research and EBP education seems to be varied across content, delivery and assessment. Such variation was evident in research teaching, even in the pre-EBP era (Overfield & Duffy, 1984) and the discussion in this section will show that this continues to characterise research and EBP education. These variations are apparent in both the research papers reviewed and in discussion and evaluation papers about research and EBP education. Differences relate to approaches to learning and teaching, both for research and EBP individually, as well as how they integrate with one another and the ways that research and EBP are linked is addressed in the next section.

2.3.1 Relationship between research and evidence-based practice

Throughout the literature the need to teach both research and EBP is taken as a given for undergraduate education. EBP is accepted as part of being a nurse and this position is reflected in postgraduate nursing education (Fernandez, Tran, Ramjan, Ho, & Gill, 2014), as well as in the need for research utilisation in healthcare settings (Wallin, Gustavsson, Ehrenberg, & Rudman, 2012). Cordiner and Davis (2010) note that “Evidence-based practice has been accepted as a process to assist health professionals in clinical decision making to improve patient outcomes” (p179). Given that this view is the norm in the nursing education literature, it follows that to become evidence-based practitioners, student nurses

need to acquire skills of research and EBP to underpin their future nursing practice (Henoch et al., 2014). Most research is based on this need for students to be able to apply evidence when they enter professional practice and all the studies that were considered recognised the need for students to be research aware.

Research skills have been included in undergraduate nursing curricula for over 50 years (DiPietro, 1967; Wax, 1966) and EBP has been taught alongside research since the early 1990s, with the growth of the EBP movement in healthcare (Mantzoukas, 2008). Almost 30 years ago a review of research teaching in nursing found evidence of three main approaches that are largely the same as those used today (Overfield & Duffy, 1984). These focus on student nurses as what Kim et al. (2009) describe as “evidence consumers” or as “evidence generators” (p1219). The former centres around learning about how to appraise research, whereas the latter is about the learning achieved through undertaking research activities, either in clinical environments or with research-active faculty members. A third hybrid category supports learning through development of research proposals, which Arthur and Wong (2000) refer to as “learning by proposing to do” (p662). Within these three categories a wide range of innovative strategies have been reported. Many are presented in descriptive accounts or as discussion papers, which give detail of an innovation in teaching research or EBP, but with little or no evaluation of the approach (Moch et al., 2010). Although interesting, such papers offer little contribution to the evidence base.

Many studies address EBP or research skills individually, but at times they are treated as one. Studies recognise the link between research skills and EBP, but in some there appears to be limited distinction between the two and some papers that appear to focus on research are in fact more centred on EBP. Consider, for example, the title “*Research odyssey: The evolution of a research partnership between baccalaureate nursing students and practicing nurses*” (Gray, 2010). This longitudinal study was in fact research into how student nurses developed EBP skills through working with nurses in clinical settings. While understandable, such an approach is unhelpful, as it masks the differences between the two topics. It also makes it difficult to distinguish a set of skills required for EBP and the underpinning knowledge about research methods that might be required to support EBP skills. In Gray’s article the students were instructed to “Develop a research question related to the problem” (p377), though this instruction is in fact about developing a search question to orientate a literature search. Subsequently the questionnaire asked students to “describe in what ways this research project partnership were helpful to your learning about the research process related to evidence-based practice” (p380). Such wording is potentially confusing by describing EBP as having a “research process”.

When looking at the scope of undergraduate education in research and EBP, two different, but complementary, views emerge (Wheeler, Hardie, Schell, & Plowfield, 2008). The first identifies the need for research and EBP education to be included for undergraduate nursing students, to

prepare them to be evidence-based practitioners, such as Mattila and Eriksson (2007). This concurs with regulatory requirements for nursing education and supports preparation of practitioners for clinical practice. The second view is more focused on the development of nursing as an academic discipline. In this case a research curriculum, in particular, aims to raise the academic calibre of nursing and to encourage nursing students to consider a career in clinical research, for example Ervin and Cowell (2004). Peckover and Winterburn (2003) described a lack of consensus in these views about why research is included in nursing curricula; some literature focuses on the need to develop practitioners fit for EBP (Norman, 2014), while other papers identify the move into HE and the professionalisation of nurses as the driver for including research in curricula (Reutter et al., 2010). However these are not mutually exclusive and many publications, both research and discussion papers, recognise the reality of preparing evidence-based practitioners, while also encouraging students to consider a research career (Ax & Kincade, 2001). That said, the level and type of knowledge to prepare students to be active researchers, compared to being able to appraise and implement research findings, as evidence-based practitioners, is likely to be quite different and this was not addressed in any of the papers reviewed.

Despite these different demands or priorities, there does appear to be some agreement about at least part of the rationale for teaching research skills, which relates the way in which these underpin EBP. Most studies either implicitly or explicitly present research skills development as

essential for developing students into evidence-based practitioners, such as Arthur and Wong (2000).

In the context of these varying aims of research and EBP education, there is generally less expectation that students are being taught research skills to enable them to undertake research, though this is considered by some as an adjunct (Irvine et al., 2008). The emphasis on teaching research skills to support EBP also seems to have become more dominant in more recent literature. What is clear regarding the relationship between research and EBP is a consensus that research skills underpin EBP and that both need to be included in the undergraduate nursing curriculum. Where the relationship appears more confused relates to which aspects of each should be included and how they are taught to students. This variation in the approaches to learning and teaching is reviewed in the next section.

2.3.2 Diverse approaches to learning and teaching

There is an absence of norms or common approaches to teaching research and EBP in the literature and this is reflected in a range of strategies for learning and teaching, as well as in the different settings in which research and EBP education takes place. This variety is spread across both topics and is also reflected in the many discussion and evaluation papers published in this area.

It is immediately noticeable that different learning environments are used for teaching research and EBP. Some research studies reviewed have a clinical setting for learning about research and EBP, though the majority are based in the university setting and this breakdown is shown in table 2.3.

Setting	Research focus	EBP focus	TOTAL
Learning in university	12	9	21
Learning in practice	4	5	9
Teachers' experience	2	0	2
Literature reviews	3	1	4
TOTAL	21	15	36

Table 2.3: Research papers focus and setting
(including literature reviews)

The variety is also reflected in evaluations and descriptive papers about research and EBP education. For example Davies et al. (2002) evaluated the use of Welsh students as research assistants in a clinical setting and other evaluations in the United States have taken similar approaches (Mohide & Matthew-Maich, 2007; Peterson & Schaffer, 1999; Thompson, McNeill, Sherwood, & Starck, 2001). Other evaluations have taken place in university settings, such as Jakubec and Astle (2013) and Burke et al. (2005). In a review of the literature Moch et al. (2010) identified strategies for EBP education in undergraduate nursing between 1997 and 2007 and they suggest that there is evidence of a move towards increasing partnership between academic and clinical settings, to strengthen EBP.

The papers reviewed may tentatively support this; of the nine papers reviewed that had a practice setting, seven were published within the last five years. However the majority of primary research papers included in the review (21 of 32) were university based.

The different settings for research and EBP studies points to a tension between the academic nature of these topics, which might require a classroom-based approach and the need to be practice focused, which may demand a clinical setting. The relevance of both research and EBP to clinical practice is an issue that is raised in many of the papers reviewed, as an on-going area of concern among educators (Waters, Crisp, Rychetnik, & Barratt, 2009). Setting education at least partly in the clinical area, is reported by some as a means of successfully overcoming this issue (MacVicar, 1998). However, although there is agreement on the need for students to see the relevance of research and EBP to practice, the use of the practice setting to achieve this was not always found to be optimal. Florin, Ehrenberg, Wallin, and Gustavsson (2012) surveyed student nurses across Sweden and the students reported that university based instruction was more effective than clinical education in developing EBP competence. Such a finding appears to contradict other studies, though this study did not look at specific interventions to develop EBP, which may have led to the disparity. The evidence about the relative effectiveness of practice or university settings for research and EBP education is quite mixed, but underpinned by a consensus that it is

important for students to understand the relevance of research and EBP to their nursing practice.

As well as different settings for learning, a wide range of different approaches to learning and teaching is reported in the literature and this is the focus of the remainder of this section. Eleven of the studies reviewed investigated the effects on learning of students being actively engaged in research work or an EBP project, with six of these involving students doing a range of research activities. Duggleby (1998) and Henoch et al. (2014) both tested the use of students as data collectors, using a pre- and post-test design, though Duggleby's study was university based, whereas the other was set in hospital wards. Both studies reported favourable results, though Henoch et al. (2014) focused on stimulating interest in nursing research rather than on developing research skills. Duggleby (1998) reported improvements in attitudes and confidence among a group of 18 students who carried out research interviews, suggesting that active research experience may have positive effects on understanding and attitudes. This outcome needs to be viewed with caution, though, given the small size of the participant group.

A different approach was taken by Reising (2003), who investigated students' thematic analysis of qualitative data, gathered in interviews with each other. Findings showed that these undergraduates were quite successful in identifying the themes. However, the study reported very little data, making it difficult to assess the reliability of the results. Three

quasi-experimental studies, all based in the Far East, looked at students undertaking a research project, though Tsai, Cheng, Chang, and Liou (2014) and Liou, Cheng, Tsai, and Chang (2013) reported on the same study, albeit with a different focus, so the results reported were broadly similar. These three studies found a mix of positive and negative results in terms of student understanding and attitudes, but the studies measured quite different outcomes and the Tsai et al. (2014) data appeared to have errors in the calculations. This small number of papers that approached research education by actively involving students in research all took innovative, but very different approaches, so it is difficult to compare outcomes. Generally, though, they seem to show a short-term benefit from this type of learning, either in knowledge or attitudes to research.

The EBP focused studies that used an active engagement approach took broadly two approaches to the activities used. Some studies required students to undertake evidence-based projects with support from clinical staff (Gray, 2010; Kim et al., 2009; Mattila & Eriksson, 2007). Across these studies, students were positive about the project work and reported improvements in understanding of EBP and associated research concepts. However only Kim et al. (2009) investigated attitudes to EBP and intended future use, finding that there was no significant difference in the post-test scores between their intervention and control groups. These studies also used different methods and measures of impact, though all found positive effects from involving students in clinical EBP projects. The other two studies that focused on EBP activities investigated clinically based journal

clubs using a largely quantitative approach (Laaksonen, Paltta, von Schantz, Ylönen, & Soini, 2013; Mattila, Rekola, Koponen, & Eriksson, 2013). These studies had quite mixed results, with students reporting favourably on learning from the activity, but also reporting more negatively on issues like the time-consuming nature of the preparations (Laaksonen et al., 2013) and not being able to apply the evidence discussed in practice (Mattila et al., 2013). Similar to the research focused studies, the results from these EBP studies were broadly positive, with students well disposed towards the EBP activities and reporting benefits to understanding of EBP, alongside some concerns about use of evidence in practice.

These studies all used innovative and “learning by doing” approaches to investigate either research or EBP learning. They reported that the activities were an effective way of learning, but they were almost exclusively self-reports of students’ experiences and attitudes, with no measurement or detailed reporting of how this type of learning compares with alternatives. The exception to this was Kim et al. (2009), who compared an EBP intervention with a control group and also measured knowledge through an assessment, rather than gathering self-reported data. As noted above, the results of this study were mixed.

There is a noticeable absence of a pedagogical or theoretical basis in most of these studies, particularly in the choice of teaching strategy. Choices of interventions and approaches are not clearly justified and the

variety of approaches and outcomes measured makes it difficult to compare studies. A further concern is raised by Gray (2010) about the practicality of activities involving clinical staff to support students undertaking research or EBP activities. Gray's study identified problems for students working with busy nursing staff in all three years of the study, due to lack of time available for clinicians to give to the students. In an evaluation of clinically based learning, Mohide and Matthew-Maich (2007) also question whether there is potential to routinely offer clinically based research activities to a large undergraduate class. The evidence across these studies suggests that activity based approaches are received positively by students, but some concerns were expressed about the potential for larger scale implementation, particularly in practice settings.

There is also evidence of positive effects from traditional, classroom based teaching interventions. Of the six studies examining such interventions, four were principally about research teaching and two related to EBP. Although there was no active participation in research or EBP activities, a range of learning activities was used. These included varied approaches to assessment, including research proposal work (Arthur & Wong, 2000; Dobratz, 2003) and a more theoretically based assessment combining an essay about research paradigms along with an exam (Halcomb & Peters, 2009). Arthur and Wong (2000) reported the research proposal as an innovative approach to teaching and assessment, whereas Dobratz (2003) presented this as a traditional, theoretical approach. Such confusion about what may be defined as innovative or active approaches is not limited to

these studies. In an evaluation of teaching research to so-called “millennial learners”, McCurry and Martins (2010) included small group work and presentations by clinical researchers as innovative activities, with traditional activities defined as lectures, reading and other didactic and individual activities. These definitions are not consistent with well-established approaches to adult learning based on group work, such as problem-based learning, which is widely used in healthcare education (Neufeld & Barrows, 1984). Applying this definition of “innovative” to what are well-recognised approaches, such as group work, makes it difficult to separate genuinely creative or new approaches from active, but established, pedagogical approaches.

Across the classroom based studies results were mainly positive, though the student data was mainly self-reported, a common feature of all the studies included in the review. Dobratz (2003) notes that most studies and evaluations of research education in undergraduate nursing do not assess learners’ understanding of research concepts, but then fails to evaluate this in her own study, focusing on students’ perceptions and experiences of the module. Dyson (1997) and Halcomb and Peters (2009) also focused on the students’ experiences, but Arthur and Wong (2000) tested students’ knowledge before and after the module, with positive outcomes. These studies all report favourably on students’ experiences of a research module and perceived learning, though with mixed results in part. For example in the study by Dobratz (2003), 43% of students reported being “intimidated by research language and terminology” (p387). Of the four

classroom-based studies that looked at research learning, only two collected data at the start of the module, so it was impossible to assess change in the other two (Dobratz, 2003; Halcomb & Peters, 2009). Furthermore, three of these studies were over 10 years old and the data reported by Dobratz (2003) was collected between 1990-1991. This makes it difficult to assess whether such approaches remain current.

Although the literature review focused on research studies, there is also evidence about the range of approaches to learning and teaching from the evaluation and discussion papers that are common in nursing education literature. Moch et al. (2010) reviewed 46 papers about EBP teaching strategies published between 1997 and 2007. Their findings mirror the research studies reviewed here, identifying a mix of approaches to learning and teaching. They also found tentative evidence that more active and practice based approaches promote learning. However this is still a developing area, a point underscored by their comments on the pilot nature of most of the work included and a corresponding lack of full-scale projects that could show the practicalities of implementing new approaches across large undergraduate cohorts (Moch et al., 2010).

The picture across the different approaches to learning and teaching is of students generally responding positively to teaching and particularly to more innovative approaches. There appears to be a range of creative approaches to research and EBP teaching and this applies not just to the research studies reviewed, but also to the many evaluation and discussion

articles that were not included in the review. Some evidence of this was identified in a phenomenological review of research teaching. Porter and Mansour (2003) reviewed 77 articles and found that teachers were focused on “stimulating collaborative learning about research” (p135), as well as “fostering communication skills specific to nursing research”, “creating mentored opportunities to practice the research process” and “promoting enduring patterns of research utilization” (p136). Such goals seem to reveal concern for skills’ development in research particularly, which goes beyond simple achievement of learning outcomes and may offer insight into the wide range of approaches presented in the literature. A different, but consistent, perspective on this is given in a later study by the same authors in which academic staff were asked about their experiences in teaching research (Mansour & Porter, 2008). A theme of “marketing research content” was identified (p893) which reflected the creative and varied approaches taken in teaching research skills.

To summarise, the evidence around approaches to learning and teaching suggests that students respond well to a range of teaching strategies related to research and EBP. Particularly they appear to value practice-based approaches and innovative approaches, though innovative is not clearly defined in most studies and so its interpretation is varied. However, this evidence also needs to be treated with caution, because research in the area is characterised by data that is largely self-reported and the research has been carried out by educator-researchers, who are likely to be well known to the students involved in the research. Most studies

collected data immediately after the research / EBP course, with no longer-term follow-up. Overall, the nature of learning and teaching in research and EBP education is varied, but there is little conclusive evidence about which approaches to learning and teaching work best and why.

2.4 Difficulties in learning

Many articles published since 1996, and some others before this date, have indicated that research and EBP are topics that students find difficult. At times this is stated as a generally accepted fact, without being substantiated by research evidence (Ax & Kincade, 2001). The research articles reviewed revealed some different areas of difficulty relating to research and EBP education and these findings are supported by discussion and evaluation literature in this area. For example, in a widely cited discussion of EBP education, Ciliska (2005) reports challenges related to research and EBP education for both educators and students, including understanding the EBP process and differences between what is taught in the classroom setting compared to what is seen in practice. References to difficulty with research and EBP can be found across the spectrum of nursing education, as well as among practising nurses (Fineout-Overholt & Johnston, 2005). Although some of the evidence is anecdotal and presented as an accepted rhetoric, it is convincing by the frequency with which those teaching research and EBP refer to it. It is also further borne out by the large body of literature about research utilisation

by nurses, which has identified lack of education as one of the barriers that nurses frequently encounter (Kajermo et al., 2010).

In reviewing research evidence three factors were found that appeared to contribute to difficulty: attitudes and perceptions; challenges specific to EBP; and challenges specific to research. Although the literature related to research and EBP tends to overlap at times, clear differences can be identified in the skills associated with these topics and these seem to be associated with unique challenges for learning.

2.4.1 Attitudes and perceptions

One source of difficulty may be students' negative attitudes to research and EBP, which then predispose them to finding research and EBP difficult to learn (Dyson, 1997). Ax and Kincade (2001) identified negative perceptions of students towards research. This was partly because they did not expect to study research during their pre-registration nursing education and other studies support this view (Gray, 2010; MacVicar, 1998). A similar finding was discussed in Porter and Mansour's narrative review of educators' experiences of teaching undergraduate nursing research (2003), in which a theme emerged of "desensitizing negative perceptions about research" (p132). The same researchers later found a similar theme of promoting research in a positive light as a key aim of the teaching process, when they asked nurse educators in the US about their research teaching experiences (Mansour & Porter, 2008). Such evidence from educators is legitimised by student comments in research studies,

such as “it is not really necessary to have research incorporated into nursing courses” (Arthur & Wong, 2000 p666) or a suggestion that teachers need to demonstrate “the relevance of the unit” (Halcomb & Peters, 2009 p64). Negative attitudes or perceptions of research and EBP are not universal in the literature reviewed, but they are found in different types of studies, including pre- and post-test studies such as Arthur and Wong (2000), surveys such as Reid-Searl, Dwyer, Jirojwong, and Hinton (2000), but most frequently in qualitative studies (particularly Gray, 2010; MacVicar, 1998; Ax and Kincade, 2001). Although a negative attitude is not of itself a difficulty in learning, it may contribute towards subsequent problems for students, as implied by those educators who saw positive promotion of research as a key part of teaching (Mansour & Porter, 2008).

A lack of relevance of research and EBP to nursing practice is identified in some studies. Ax and Kincade (2001) found that students did not feel that what they had learnt about research was transferable to clinical practice. Halcomb and Peters (2009) also identified a challenge for those teaching nursing students to show how research relates to practice. In their survey of Australian students, almost half of the 205 students responded negatively to the statement “I was able to see the relevance of this unit to my course” (p63). To address this concern, some studies used practice settings for learning about research to investigate whether student attitudes about the clinical relevance of research and EBP may become more positive. Duggleby (1998) used one student group as research interviewers, while studying a nursing research course, while another

group only took the classroom-based research course. Significant differences were found between the groups in the post-test for EBP-related items such as “Importance of using research more than intuition in making clinical decisions” (p251). However, this study was small (n=38) and other clinically based studies report more mixed results. Gray (2010), for example, reports some negative attitudes, such as “I am never going to do research. It won’t help me with NCLEX¹³” (p379). Florin et al. (2012) surveyed 1440 students from the 26 Swedish universities delivering nursing education. They found that the relevance of research and EBP was better conveyed through classroom based teaching, rather than clinical education. From the research evidence available, it is unclear how the learning setting influences students’ perceptions of the relevance of research and EBP to nursing practice. Across the range of studies that looked at some aspect of the relevance of research and EBP to nursing practice, the evidence suggests that education is likely to improve students’ appreciation of the relevance of research and EBP to nursing practice, but the extent of this and which strategies or settings are best to achieve this are quite unclear.

From the research evidence, as well as other discussion and descriptive literature, there appears to be a perception from both educators and students that EBP and research are difficult. When looking at why this may be the case, two factors recur: negative attitudes to research and EBP; and perceptions that research and EBP are not relevant to professional

¹³ NCLEX is the US exam students sit to become registered nurses

nursing practice. The following sections look at EBP and research in turn, to assess the specific difficulties related to each of them.

2.4.2 Evidence-based practice

Different models for the EBP process have been devised and applied but there is a general consensus that EBP is a process made up of several linked activities (Barker, 2010). These include designing a search question; finding and reviewing evidence; appraising evidence; applying evidence-based change to practice; and evaluating the practice change. Information skills can be broadly viewed as encompassing the first two stages (Jacobs, Rosenfeld, & Haber, 2003) and there is some evidence that these pose problems for nursing students. Roberts and Ousey (2011) found that the students surveyed (n=110) largely relied on search engines such as Google Scholar, rather than healthcare databases, such as CINAHL, which implies either poor understanding or lack of rigour in accessing high quality resources. Cader, Derbyshire, Smith, Gannon-Leary, and Walton (2006) also reported student concerns with finding current, relevant information and with evaluation skills for web resources.

Information skills and critical appraisal (the third stage of the EBP process) were explored in a pre- and post-test study of Chinese students, in which some positive results were shown relating to EBP learning (Zhang et al., 2012). However the researchers reported difficulties with students identifying an appropriate topic for an evidence review, as well as with students either accepting published literature as faultless, or being overly critical in the appraisal process. Jacobsen and Andenaes (2011) identified

a concern about information skills relating to student expectations. In both the intervention and control groups of their study, students were reported to have an “unrealistic view of their ability to conduct efficient literature searches” (p901) and the researchers reported weak skills related to searching and appraisal of resources, though a low response rate reduced the reliability of their results.

Together, these studies provide some evidence of difficulty, but no explanation for it. Stokes and Urquhart (2011) suggested that problems in applying information skills might be associated with confidence or self-efficacy. They surveyed 261 students and used self-efficacy as one measure to assess information skills, along with learning styles and personality types. The results suggest that when students’ confidence is higher, they are more likely to demonstrate the problem-solving skills required for good information literacy, such as “think about their search, work out strategies; and build and adapt their searches” (p908). By contrast students with lower levels of confidence will be weaker in such skills. This paper provides an insight into why some students may find information skills associated with EBP difficult. Since they do not address difficulty overtly, this needs to be treated with caution. However, taken alongside the other evidence about aspects of information skills, these appear to be a component of EBP that is challenging for nursing students.

There is a wider body of literature beyond undergraduate nursing education that supports the potential difficulties of information skills,

including other levels of nursing education (Jacobs et al., 2003) and other healthcare disciplines (Maranda, Halliday, Murray, & Pinchin, 2013). Information skills difficulty has also been addressed in the threshold concepts literature and this is explored in section 3.1.2.

The remaining steps of EBP relate strongly to clinical practice, i.e. implementing EBP change and evaluation of that change. Although some studies have looked at the use of the clinical environment to teach EBP, there is an absence of work on students applying evidence in practice or evaluating a practice change. In fact, a recent survey of students' learning about EBP through taking part in journal clubs, found that students were not able to use the evidence reviewed in practice (Mattila et al., 2013). At times there even appears to be misunderstanding of these steps in EBP. Mattila and Eriksson (2007) state "It is possible to apply the newest research knowledge to nursing practice by working on research articles and by learning critical reading skills" (p575). This statement is rather misleading, as the study did not offer any evidence of practice change by students, though it found that students identified understanding of the link between research findings and changing practice. A longitudinal study in which students partnered clinical staff in evidence-based projects had mixed results (Gray, 2010). The focus appeared to be on analysis of evidence, rather than implementing it and although some of the students in the study reported benefits of seeing evidence used in practice, others found the project "confusing" and "overwhelming" (p379). There seems to be limited evidence available about how, or whether, nursing students can

implement and evaluate evidence in practice and the evidence found gives no clear conclusions.

The difficulty for students in implementing and evaluating evidence-based change is mirrored in the wide body of literature about research utilisation in nursing. The BARRIERS Scale has consistently found a range of factors that impede research utilisation. The strongest of these are organisational barriers, but nurses' knowledge about finding and critiquing evidence is also apparent (Kajermo et al., 2010). These diverse sources of evidence suggest that EBP, as a concept and in its component parts, is potentially difficult for students.

2.4.3 Research

While many of the studies reviewed refer to anecdotal evidence or received wisdom that students have difficulty in learning about research, few directly include assessment of the types and levels of challenges in research and even fewer have researched the sources of such difficulties. Some studies reported difficulties in understanding specific aspects of research and one qualitative study in particular focused on the learning process, including challenges encountered by undergraduate students (Ax & Kincade, 2001). Although this study is over 10 years old, it is particularly useful because of the detail provided about problems that students encounter related to learning about research. Ax and Kincade (2001) carried out in depth interviews with 12 students and linked a negative attitude - expressed in the study as "resistance" (p161) – with difficulties in learning about research. They report frequent references to difficulties

from the students, including the research process and the language of research and they suggest that the timeframe of a module is insufficient to allow students to absorb research concepts and terminology. Dobratz (2003) substantiated this concern with terminology, to an extent, in a survey of two sets of students (in consecutive years) that evaluated a theoretically based research module. Of the 47 students who responded, 43% (n=20) reported finding research terminology daunting, though the findings were self-reports and the data had been collected over 10 years prior to the article being published.

Ax and Kincade (2001) also found evidence that the term “research” is itself troublesome. Many students “believed the term *research* mainly described the steps involved in a literature search” (p164). Given that in common usage, the term research is often used to refer to “The act of searching carefully for or pursuing a specified thing or person” (OED online, 2014a), the misunderstanding expressed by students in this study is understandable. A related, but somewhat different, issue with the term research was also noted by Mattila and Eriksson (2007). In this study students were asked to present a review of a research article, but 11 of the 23 who took part did not use a research article, despite instructions, implying that they may not have understood what constituted a research article.

Another qualitative study that explored third year nursing and midwifery students’ experiences of learning about research provides a different

perspective on the difficult nature of research. MacVicar (1998) looked particularly at how the students' understanding of research developed and impacted on their use of research in practice placements. Nineteen participants, of whom nine were nursing students (the remainder were midwifery students), were interviewed through their three years of study. The students described feelings and experiences of difficulty related to their early learning about research, such as "...was frightened: would never be capable of understanding... it just seemed so overwhelming" (p1310). MacVicar describes this as a "pre-merged" state (p1309) in which students described a sense that research and nursing were unconnected, using terms such as "panic", "frightened" and "confusion" (p1310), when they first started learning about research.

The literature review points to some preliminary evidence that specific concepts, terms and sub-topics of research pose challenges for students. This evidence is quite scant and some papers only address positive outcomes of their findings that are based on self-report responses to questionnaires (Duggleby, 1998; Dyson, 1997; Tsai et al., 2014). However one aspect of research – statistics – was the focus of three research studies and one review article. This is particularly important because the evidence on research utilisation in clinical practice identifies statistics as a key barrier for nurses implementing research evidence in practice. Kajermo et al. (2010) found in their systematic review that the factor "The statistical analyses are not understandable" was one of the top 10 barriers across the 53 studies reviewed (p4). This factor was also listed as a

“moderate to great barrier” (p3) by more than half of the nurse respondents in 36 (68%) of the studies included in the review.

Epstein, Santa Mina, Gaudet, Singh, and Gula (2011) carried out an integrative review of studies about teaching statistics to undergraduate nursing students between 1980 and 2010, but found little evidence to support specific approaches to teaching statistics. They commented particularly on the virtual absence of studies that address “mathematical and statistical anxiety” (p11), though they note that, similar to research, there is plenty of anecdotal evidence about students finding statistics difficult. Recently Hagen, Awosoga, Kellett, and Damgaard (2013) addressed this issue in a qualitative study, with first five, then 10 students participating in two focus groups. Looking at students’ perceptions of statistics before and after an undergraduate statistics course, they found that fear of maths and numbers contributed to worries about statistics. A perceived lack of relevance to nursing was also a concern before the course.

In a quantitative study, complementing the qualitative one, Hagen, Awosoga, Kellett, and Dei (2013) looked at student attitudes to statistics before and after the statistics course. Their results validate the findings of the qualitative study as well as the anecdotal evidence referred to by Epstein et al. (2011), with students reporting quite high agreement for three statements about statistics being frightening, difficult and hard to understand before the course. In the post-test, agreement with these statements was significantly lower, with $p < 0.001$ reported for the three

items. Some contradictory evidence was found by Mathew and Aktan (2014), who used an existing 36 item tool to measure nursing students' attitudes to statistics. They found a marginally positive attitude among undergraduate nursing students, with an average score of 153 from minimum and maximum scores of 36 and 252 respectively. However, they also found that nursing students with greater previous experience of statistics had a poorer attitude to statistics, which conflicts with findings from the other survey (Hagen, Awosoga, Kellett, & Dei, 2013). Across the articles reviewed attitudes towards statistics were found to be quite negative, including feelings of apprehension and fear. This is concerning because students ideally need some understanding of statistics used in healthcare research, to be able to evaluate research evidence (Mathew & Aktan, 2014).

A challenge was also identified regarding the curriculum for research at this level of study. Some studies and papers gave detail of the areas covered. In an evaluation of research learning, Irvine et al. (2008) listed a comprehensive set of research topics taught to second year students. These encompassed all aspects of research design, from question development to dissemination activities, as well as both quantitative and qualitative methods. However there was no evaluation of learning presented in the paper, at the level of these different components of the research curriculum. Other studies have assessed research knowledge and this potentially offers another way of identifying norms about which aspects of research are taught to undergraduate nursing students. Arthur

and Wong (2000) assessed components of research knowledge and skills of 74 students, which broadly matched those identified by Irvine et al. (2008). Additionally, Arthur and Wong (2000) also included ethical considerations, specifically consent forms. A different perspective is offered by Overfield and Duffy (1984) in their widely cited paper, which was the first review of research teaching studies in undergraduate nursing education. They do not identify a discrete curriculum, but propose that research should be taught by mirroring the different parts of research papers. The paper predates the EBP movement, but it implies that critical appraisal skills will underpin research teaching, because nursing students need to understand a wide range of research concepts and terms, to be able to critically read research papers. Although presented in different terms, Overfield and Duffy appear to support the syllabus presented in other papers, which include all aspects of the research process and a range of different methods.

A study of Latin American nurse educators attempted to specify the research competencies expected at undergraduate and postgraduate levels in nursing education (Harrison, Hernandez, Cianelli, Rivera, & Urrutia, 2005). This survey had a poor response rate but the findings from 52 respondents are interesting and show that this group expected a very wide range of skills at undergraduate level. This includes competencies such as “knowing or elaborating theoretical frameworks for research”, “knowing quantitative and qualitative research methods”, and “managing statistical computer programs” (p9). The findings of this study suggest an

even wider and more complex curriculum for research than the curricula implied in the other studies described above. It paints a picture of undergraduate research education that covers a range of methods and skills in both qualitative and quantitative traditions and aims to address all aspects of the research process. To an extent, this is confirmed by Porter and Mansour (2003), whose review of the literature related to teaching research in undergraduate nursing found that teachers aim to help students to “develop basic research skills” (p135) and to give them experience of the research process. There is potentially a considerable challenge for students if such a wide-ranging curriculum, as described in these papers, is the norm. At undergraduate level, expectations that students can understand a wide range of concepts across the research process and relating to different paradigms, appears quite demanding, particularly in the context of the other difficulties already identified.

Despite the general expert consensus that research is challenging for undergraduate nursing students, there is a relatively small range of evidence about specific concepts or aspects of research that students find challenging. In part, this may be a result of the research questions and aims for studies, which usually look for positive outcomes and improvements. It may also be linked to the practitioner nature of much of the research carried out, which could bias student responses in favour of reporting positively on experiences. The most frequently reported response to the issue of difficulty is to evaluate a new or revised module of learning and such studies usually report only positive results. Only one

study in this review assessed whether self-reported positive results were supported by objectively assessed improvements in knowledge and understanding (Arthur & Wong, 2000). Furthermore, difficulties reported in learning about the components of research and EBP, have not been investigated in detail to establish the nature of the difficulties and how they impact on student learning. There seems to be a general impression of difficulty for students in different aspects of learning about research and EBP, but relatively little understanding of how deep-seated this is or why it is the case.

2.5 Effectiveness of research and evidence-based practice education

Many of the studies in this review aimed to identify some aspect of development or change relating to research or EBP education. Twenty of the 32 empirical studies reviewed, of which 14 were cross-sectional surveys, collected data at a single point in time and this makes it difficult to reliably identify impact or change. For example, in a Sweden-wide survey of 1440 students in their last semester of study, respondents reported that they felt well prepared for EBP (Florin et al., 2012). Despite the large sample size, the lack of earlier baseline data makes it difficult to interpret this result as evidence of change or improvement. Therefore, in reviewing impact, only studies with a pre- and post-test design (with or without control group) were included as well as two other qualitative studies that gathered data over time. These are listed in Table 2.4, with more detail in Appendix 2.

Study Authors	Focus	Design
Arthur and Wong (2000)	Research	Pre and Post
Duggleby (1998)	Research	Pre and Post
Dyson (1997)	Research	Pre and Post
Hagen, Awosoga, Kellett and Dei (2013)	Statistics	Pre and Post
Hagen, Oluwagbohunmi, Awosoga, Kellett and Damgaard (2013)	Statistics	Qualitative
Jacobsen and Andenaes (2011)	Information skills	Pre and Post
Kim, Brown, Fields and Stichler (2009)	EBP	Pre and Post
Li, Dou and Wang (2014)	Research	Pre and Post
Liou, Cheng, Tsai and Chang (2013)	Research	Pre and Post
MacVicar (1998)	Research	Qualitative
Tsai, Cheng, Chang and Liou (2014)	Research	Pre and Post

Table 2.4: Studies included in review of impact

The data from most of these studies consists of self-reports by students, though some studies also assessed knowledge of research or EBP and the qualitative studies included more detailed descriptions of the students' experiences. There is also a considerable degree of heterogeneity in terms of the data collection tools used, approaches to data analysis, sample size and the settings of the studies. In part this is useful as some evidence from diverse sources may corroborate other evidence, but it also makes it difficult to directly compare results, particularly with the range of tools used that were both pre-existing and developed by the researchers themselves. In the quantitative studies measurements were taken before the intervention and then immediately afterwards, with no longer term follow up in most. The exceptions to this are: Jacobsen and Andenaes

(2011), who collected data at the beginning of the students' studies and then at the end of their third year; Liou et al. (2013), who collected a second set of post-test data one semester after the first; and Li, Dou, and Wang (2014), who collected data at three different points in time.

A range of studies evaluated student attitudes to research and EBP and there was a lack of conclusive evidence for the impact that interventions had on attitudes to research. Two of the articles were based on the same study data (Liou et al., 2013; Tsai et al., 2014), so only the more detailed of the two has been reviewed in this section (Liou et al., 2013). This was also the largest study in the group (n=209) and used the 15 item Attitude Towards Research (ATR) scale, which measures student confidence, interest and perceived importance of research. Liou et al. found statistically significant improvements in student attitudes to research following an intervention comprising of a range of innovative learning approaches, including formative group activities and a simulated research study. Similar improvements were not recorded in the control group, who had a traditional teaching package, but it is impossible to identify the effects of the individual innovations, as they were delivered to students as a package. Dyson (1997) also found significant impact on attitudes from a research module delivered to students on both diploma and degree pathways, but the results reported were very brief, with no information about what was included in the attitudes questionnaire, that had been designed by the researcher.

These results contrast with Arthur and Wong (2000) who found no change in attitudes to research when teaching research using a “learning by proposing to do” approach (p662). This study used a different data collection tool, but the pre-test data showed that students already had quite a positive attitude to research, which may explain the lack of impact of the module. These three studies all focused on students who were undergraduates, but were already working as qualified nurses and it is not clear what effect this existing healthcare role might have had on attitudes to research. Only one study explored the attitudes of students doing their initial nursing education and this reported mixed results (Duggleby, 1998). In the control group, 20 students had no improvement in attitudes following a research module, whereas the intervention group, who did the module along with collecting interview data from retired nurses, had significant improvements in seven of 13 items measuring attitudes to research.

Among these studies looking at impact on attitudes to research of educational interventions, results are quite mixed and this pattern is similar in the two studies that looked at effects on attitudes to EBP, with one finding no change in attitudes (Kim et al., 2009) whereas Zhang et al. (2012) found significant improvements in attitudes. These studies both sampled final year students and used knowledge, attitudes and behaviour scales, though different ones. The differences may be due to the different geographical settings of the studies or the different teaching interventions being investigated, but, like the research attitudes studies, this variability

makes it impossible to draw conclusions about what factors positively impact on students' attitudes.

Both Zhang et al. (2012) and Kim et al. (2009) also looked at EBP knowledge gain, though Zhang et al. measured students' perceived knowledge gain, rather than an objective assessment of knowledge. Both studies found significant positive changes in knowledge of EBP following the intervention and Kim et al. also found that this knowledge gain was significant when compared to a control group. This is of particular interest because it is not surprising to find knowledge gain following teaching of some kind, but the lack of improvement in the control group suggests that, in this study, it was the clinically based education intervention that led to knowledge gain.

These results are also mirrored when looking at the impact of interventions on research knowledge. Both Arthur and Wong (2000) and Liou et al. (2013) found a positive impact on research knowledge in post-test data and for Liou et al. the significant impact was repeated, though slightly reduced, in a second post-test that was administered one semester after the end of the original intervention. This longer term follow up suggests that students retained knowledge beyond the end of their teaching and a longer term impact on knowledge gain was also found in a study in which students undertook a research project and were tested on a range of research skills at three points (Li et al., 2014). However it is unclear from

the paper what form the testing took, so the reliability and validity of these findings are questionable.

Knowledge and attitude were the most common aspects of research and EBP education that the pre- and post-test studies focused on, though some other areas were reviewed by individual studies, reflecting to an extent the different tools used. Zhang et al. (2012) and Kim et al. (2009) both looked at EBP behaviours, though Kim et al. sub-divided behaviours into use and future use of EBP. Zhang et al. reported a significant improvement in use following clinical learning about EBP, but gave no other detail or information about items in the EBP behaviour sub-scale. Kim et al. also found a significant improvement in behaviour following clinically based EBP learning, but this impact was not mirrored when looking at the future use of EBP. In terms of applying EBP to nursing practice, following graduation, this finding is potentially more interesting and more worrying, since it suggests that learning may not transfer into practice.

Further explanation of this finding may be found in another study by the same group of researchers. This study used the same tool, but in a cross-sectional survey of students in three different years (Brown et al., 2010). In this study two specific factors were linked to use and future use of EBP, i.e. confidence in clinical decision-making and preparation for clinical practice. This provides some evidence that the impact of EBP learning on practice

is influenced by other student-related factors, not simply knowledge and understanding.

Arthur and Wong (2000) studied knowledge, attitudes, research orientation and self-reported competence, finding significant improvements in orientation and competence at post-test. However, although a strongly significant correlation was found between attitudes and orientation at pre- and post-test, there was no significant correlation between competence and knowledge. This suggests that students' self-reported competence did not match the more objective measurement of their research knowledge and highlights one of the main concerns with most of the quantitative studies, which rely very heavily on self-reported data that may be unrealistically positive.

This concern was raised by Jacobsen and Andenaes (2011) who surveyed students at the start of their first year and then at the end of third year. Students had been divided into two groups, with different approaches to learning and assignments relating to information skills development. The post-test data showed that neither group had the skills required to effectively search for and select literature, which is concerning, given that such skills are fundamental to EBP. By comparing student self-reports to assessment of their knowledge, the study also showed that students had inaccurate views of their literature search skills. This study focused on information skills, but concerns of inaccurate perceptions of students

about their competence suggest a need for caution when interpreting the results of other studies that looked more generally at research or EBP.

Two linked studies, carried out in the same setting, evaluated impact on attitudes towards statistics (Hagen, Awosoga, Kellett, & Dei, 2013; Hagen, Awosoga, Kellett, & Damgaard, 2013). In the quantitative study a 13 item tool was used and some items, particularly those associated with the “fear and anxiety” factor, showed a strongly significant change in attitudes ($p < 0.001$), whereas self-confidence and computer comfort factors were not conclusive regarding impact on attitudes. The other study used focus groups before and after a statistics course and found changes in students’ attitudes, notably reduction in fear and anxiety. The students also talked about moving from being sceptical about the relevance of statistics to nursing to more positive feelings, though Hagen, Awosoga, Kellett, and Damgaard (2013) note that this somewhat contradicts the quantitative study, which found that students were only mildly positive that statistics would be relevant to their practice (Hagen, Awosoga, Kellett, & Dei, 2013). Although these studies are encouraging in their results, no other studies looked at the impact of statistics education for undergraduate nurses. This gap in evidence is highlighted as a concern by Epstein et al. (2011), who point out that an understanding of statistical concepts is needed to be able to evaluate nursing research articles, yet there is no evidence about which teaching strategies are more successful in this subject.

Across this range of largely quantitative studies, evidence of impact is sketchy and at times contradictory, characterised by inconclusive evidence in a range of aspects of both research and EBP education. There are also very few qualitative studies looking at any aspect of research and EBP learning in undergraduate nursing and fewer still that review impact. However one qualitative study followed 19 nursing and midwifery students over their three years of study and provides some evidence of varying impact on students of research education (MacVicar, 1998).

In the early part of their studies, these students were found to be fearful and frightened of research, viewing it as not relevant to their practice. MacVicar describes this as a “pre-merged state” (p1309). By the end of their studies, students emerged from this state to a changed understanding of research and how it influences clinical work and MacVicar identified three different levels of impact. The first of these levels, described as “mergents” (p1310), is characterised by a positively changed view of research, but one in which students remained uncertain about research; students would read research reports but would not actively initiate research-based activities. The other categories identified by MacVicar, “initiators” (p1311) and “visionaries” (p1312), described changes with much more impact that resembled a more fundamental ontological shift. These students described active commitment to research, beyond simply accepting the value of research and the visionaries also demonstrated creativity and desire to explore different aspects of research. Although written before threshold concepts were conceptualised, this

paper appears to describe and analyse students' experience of a threshold concept of research, in the context of clinical practice, showing the degrees of impact that learning can have.

2.6 Summary of evidence and gaps in knowledge

The existing body of literature about research and EBP in undergraduate nursing education focuses strongly on teaching approaches and is largely quantitative in nature. Despite the acknowledgement that students perceive research and EBP to be relatively difficult topics, there is quite limited evidence about what students find challenging, though some specific areas, such as statistics and terminology, have been identified in different studies. However, there is very little evidence of why students find learning about these topics difficult and what their experience of learning is in this area. The focus is frequently on the outcomes of interventions, but with no consistency in the nature of these interventions or the tools used to evaluate them. Research evidence about the impact of learning about research and EBP is therefore varied and inconclusive, though some studies have found positive effects of teaching strategies on attitudes to research and EBP, as well as on knowledge and use. Only one study could be identified that looked at research learning over time and focused in detail on the experiences of individual students (MacVicar, 1998). This study pre-dates threshold concepts but described the students' experience in a threshold-like way, including the difficulties encountered, liminality and transformed understanding. However MacVicar focused only on research learning and no similar evidence is available for EBP.

Most of the literature found investigated the effects of learning and teaching strategies. Although difficulties in learning have been identified, there has been no work that studies such difficulties in depth or tries to establish why such difficulties might exist. Furthermore, although impact on students' level of knowledge and understanding has been identified in research studies, the nature of transformation in student learning has not been previously studied.

Over 15 years ago Parahoo (1999) commented that much of the published work about research education in undergraduate nursing is descriptive, mainly offering accounts of strategies and approaches to teaching research. He identified a need for more research studies on this topic. In subsequent years, there have been a substantial number of publications relating to research and EBP teaching in the undergraduate nursing curriculum across the developed world, as well as papers reflecting the situation in some developing countries. This has led to some increase in what is known about learning and teaching of research and EBP, particularly relating to the short-term effectiveness of specific educational interventions, as described in section 2.5. However many of the publications are small scale surveys, evaluations, or discussion papers, which tend to rely on students' self-reported data.

Much remains unknown about learning and teaching in research and EBP and what is known centres around teaching strategies and student perceptions of these. While the evidence tends to show that different

teaching approaches can benefit student learning, there is no firm consensus on which strategies in particular are best and very little is known about how nursing students experience learning about research and EBP or why they find these topics difficult.

2.7 Research questions

Two research questions were identified for the study, based on the literature review. These questions also draw on the practice issues identified in chapter 1 and threshold concepts, which is the key theory underpinning the study and which is explored in more depth in section 3.1.2.

- How do undergraduate nursing students experience and manage difficulty in learning about research and evidence-based practice?
- Which threshold concepts do undergraduate nursing students encounter when learning about research and evidence-based practice?

Chapter 3: Designing the research

The research questions identified at the end of chapter 2 are the outcome of three factors, comprising: the practice issues related to observed difficulties for nursing students learning about research and EBP; the review of research literature in this area, supplemented by the range of descriptive and evaluative literature on the topic; and the choice of threshold concepts as the theoretical lens through which to examine the issues (figure 3.1). These questions formed the foundation for the research work, guiding choice of methodology and the research design. In an iterative process, the research questions, themselves influenced by threshold concepts theory, subsequently provided a stimulus for the application of the theory in the research, as well as the choice of other theories used to inform the research work.

In this three-part chapter, the building blocks of theory, methodology and methods are explored. This includes the links and synergies among them, particularly the translation of the narrative research methodology to methods of sampling, data collection and data analysis. Such a synthesis is important to enable meaningful and creative knowledge to emerge from the research, as well as ensuring that the study is rigorous and credible (Crotty, 1998).

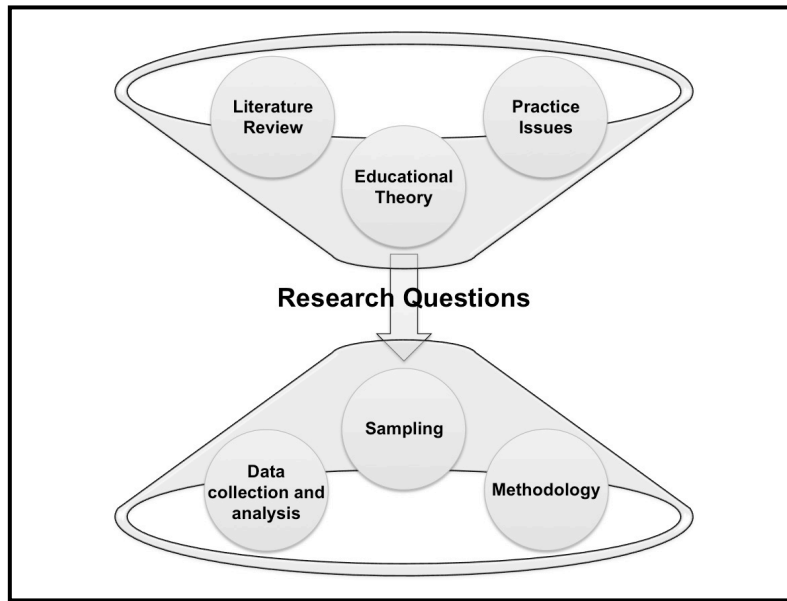


Figure 3.1: Role of the research questions

3.1 Part I: Theoretical framework

The use of guiding theory is one of the principles that separates research from activities like quality improvement or evaluation and, in qualitative research particularly, it helps researchers to uncover the value and usefulness of the findings (Reeves, Albert, Kuper, & Hodges, 2008). A strong theoretical framework for research provides us with what Crotty (1998) refers to as “scaffolding” for a study (p2). The term scaffolding emphasises that theory underpins and supports, lending purpose and form to a research study and subsequently assisting in the interpretation of the findings. In the context of educational research, Cohen et al. (2011) question the value of using so-called grand or macro theory, suggesting that it is stifling and not consistent with creativity and flexibility. Thomas (1997) also suggests that, generally, theory in educational research is not valuable. He attributes this partly to a lack of agreement about what is

meant by theory and partly because he believes that theory restricts creative thought. However the absence of a consensus on defining theory in education seems to be a poor argument for not using theory. More importantly, theory can enable research findings to be interpreted creatively, assisting a researcher to see different and new perspectives, in ways that help to generate better research evidence and, ultimately, improved educational practice (Biesta, Allan, & Edwards, 2011).

As education is one of the social sciences, educational research is concerned with social theory. In the thesis the definition of social theory by Matthews and Ross (2010) has been adopted, as “a set of ideas or related concepts which can be used to explain and understand an event, situation, social phenomena” (p32). Through the study theory has been used in different ways, relating to both methods and interpretation of findings, but always with the aim of improving the quality of the research work. This chapter presents the theoretical rationale for the study, providing an overview of the theories used. This includes both macro social theory, that aims to provide an overarching explanation of the social world, as well as theories that aim to explain a more particular aspect of the social world (Matthews & Ross, 2010). The justification for each theory is discussed individually and their synthesis and interaction are also considered. This is premised on these approaches offering a robust approach to researching student learning, in the context of this study.

3.1.1 Role of theory in the study

A range of theories was drawn on to help in the development of the study and interpretation of the findings. The starting point is the macro theory, social constructionism. Specifically, relationally responsive social constructivism has informed the research, which Cunliffe (2008) refers to as “how people shape meaning between themselves in responsive dialogue” (p128). This approach is closely aligned with narrative research, the methodology for the study, which is discussed in more detail in section 3.2. The use of social constructionism as a foundation for the study helped to guide the choice and application of the narrative methodology, particularly the data analysis. However it also provides a fundamental supposition to guide the study, that identity and understanding are guided by a range of sociocultural factors and developed through dialogue (Cunliffe, 2008). Social constructionism therefore provides a context within which to study the detail of how students develop their understanding of research and EBP.

The study made use of theory in two distinct, but related, ways, to develop the study and subsequently to guide data analysis and interpretation.

Threshold concepts theory was the principle theory used and it informed the development of the research questions, application of narrative methods to the study and interpretation of the findings. Threshold concepts theory was chosen because it provides a context for investigating how student learning occurs and specifically how students encounter and journey through a landscape of difficult and challenging

learning (Meyer & Land, 2006). Difficulty in research and EBP education was initially identified as the broad area of interest for the study, based on scoping of the evidence around research and EBP in undergraduate nursing education, as well as anecdotal evidence of this being a problematic area of learning for these students.

Threshold concepts is therefore a particularly apt theory for the study because it specifically addresses obstacles to learning, whereas most learning and teaching theories tend to focus on processes and methods to guide learning (Perkins, 2007). Threshold concepts have also been used widely in HE, where the original work was done by Meyer and Land (2003) and since then there has been a growing body of work in aspects of healthcare education, such as Clouder (2005), as well as research learning (Kiley, 2009). A further reason for the choice lay in the potential of threshold concepts to provide a setting within which to analyse difficulty that can be used to inform practice (Cousin, 2009). Given that the study assumed that EBP is an essential component of nursing practice, it was important that the research would be able to contribute to the evidence base and inform learning and teaching in this area.

Along with threshold concepts, another set of theories helped to guide the interpretation process, extending and developing understanding from the narratives (table 3.1). These can be classified broadly as theories of understanding and identity. Some are more focused on one or the other, but all contain elements of understanding and identity, premised on the

supposition that learning and identity are, at least to an extent, intertwined. For example, the work on communities of practice (Wenger, 1998) is concerned with learning, practice and identity.

Theory	Based on
Threshold concepts	Meyer & Land
Troublesome knowledge	Perkins
Social development and the zone of proximal development	Vygotsky
Communities of practice	Wenger
Narrative identity	Bruner, Ricoeur & Bakhtin

Table 3.1: Theoretical framework for this thesis

Theory related to student understanding helped to give insight into the complex and varied factors that have influenced the research participants' knowledge and understanding of research and EBP, particularly the challenges and difficulty they recalled. Aspects of theory related to identity provided an arena in which to explore and interpret participants' encounters with EBP as a key part of their emerging nursing identity. In the next section each of these theories is reviewed, including key principles and the rationale for its inclusion in the study's theoretical framework.

3.1.2 Threshold concepts

A seminal publication by Meyer and Land (2003) introduced the notion of threshold concepts and offered a research-based rationale for identifying and understanding aspects of disciplines or topics, which are inherently

difficult or problematic, but need to be understood and assimilated by the learner to be able to progress in that area of study. Five characteristics were initially identified which defined threshold concepts:

- *Transformative*, changing the way students think about the topic or discipline; an identity shift
- *Integrative*, enabling students to make new links with other parts of the discipline
- *Irreversible*, being unlikely to be forgotten or “unlearned”
- *Troublesome*, including ideas or knowledge that are counter-intuitive, have complex terminology or seem illogical
- *Bounded*, having limits to what they can explain and perhaps showing up new thresholds of learning.

Based on Meyer and Land (2003).

The idea of liminality is also integral to threshold concepts and it represents a time and space, often characterised by uncertainty and difficulty, in which a change in understanding is taking place, (Land, Rattray, & Vivian, 2014). Entering a liminal space requires learners to give up or reassess views and conceptions and to go through a process of reconfiguring, reworking and acquiring a new set of values and understandings (Meyer & Land, 2003). For some students, being in a liminal space may be threatening or confusing, though more recently the liminal space has also been considered as potentially creative (Land, 2014).

The difficulties and negative attitudes related to research and EBP learning for undergraduate nursing students, as described in chapter 2, suggest that many of these students encounter liminality as a hazardous environment. Since these initial features of threshold concepts were identified, others have been put forward. Most notably in the context of this study, Meyer and Land (2005) have suggested that threshold concepts have a discursive component, in which learners “will show that they can use an ‘extended discourse’ in that topic or discipline” (p375). This is particularly relevant to research and EBP education, because of the expansive terminology associated with research in particular, which is quite different to the nursing and healthcare terminologies students are familiar with (Lever, 2005).

These constructs of threshold concepts provide a tangible approach to researching the difficulties that students encounter in learning about particular topics or subjects and threshold concepts is a theory of educational difficulty that has been found to have appeal across diverse disciplines and topic areas (Cousin, 2009). The growing research base and scholarly writing in this area point to threshold concepts offering valuable insights into student learning and different research methods have been applied to investigate threshold concepts across different disciplines, including quantitative and qualitative approaches. However, as Barradell (2013) notes, threshold concepts remains a relatively new and developing theory, with a number of issues that need to be acknowledged.

The characteristics of threshold concepts are themselves open to debate, particularly around whether some or all of these are required to define a threshold (Barradell, 2013). Among those researching threshold concepts, some characteristics may be viewed as core, but others may or may not be present. For example Higgs and Cronin (2013) describe threshold concepts as “often irreversible”, “likely to have borders” and “likely to involve troublesomeness” (p162), whereas transformational and integrative appear to be definitive aspects of threshold concepts. Others have focused mainly on the troublesome and transformational dimensions (Barradell, 2013) and for some educators threshold concepts need to meet all five of the original criteria (Rodger, Turpin, & O’Brien, 2013). The on-going debate about the identification of threshold concepts underscores the range of people and disciplines, both academic and professional, in which threshold concepts theory is being applied.

The identification problem is a criticism laid out by Rowbottom (2007), who suggests that a lack of consensus makes threshold concepts theory unworkable and he identifies the term concept as a particular problem. Recently thresholds have been re-interpreted, using terms like learning thresholds (Quinnell, Thompson, & LeBard, 2013) and threshold practices (Gourlay, 2009), rather than the more restrictive “concepts”. This concern is underlined by the wide variety of ideas or concepts, topics, skills and ways of thinking that have been presented as threshold concepts. For example one of the first thresholds to be identified was the concept of opportunity cost in economics (Davies & Mangan, 2007) and within biology

the threshold of hypothesis development has been researched by Taylor (2006). These are both representative of relatively small and discrete aspects of their disciplines. Similarly, writing in the area of doctoral research learning, Kiley and Wisker (2010) identify development of a research question as a threshold, a related concept to the hypothesis development researched by Taylor (2006). However Kiley and Wisker go on to present “interpreting findings and presenting arguments” (p407) as thresholds and these appear to be much more diffuse and less easily defined. For some, like Rowbottom (2007) and others, such as Delany (2012), such issues fundamentally undermine the threshold concepts approach. However their critique misses two important aspects of thresholds theory.

Firstly, the focus is on student learning and how students manage and negotiate the process of learning the threshold, rather than just on the goal of understanding the threshold. This process can be represented by the troublesome nature of thresholds, acquisition of disciplinary discourse and experiences in the liminal space. This is not to say that identification of the concepts themselves is not important, but that it is not the whole story. The liminal space is a necessary aspect of any threshold that the student may encounter as troublesome, creative or transformative and this is an aspect of the theory that remains relatively under-researched (Land et al., 2014). Secondly, threshold concepts offer insight as a tool for what Cousin (2009) has referred to as “transactional curriculum inquiry” (p201). This potential for threshold concepts to integrate curriculum research with

curriculum design has been shown to have value across diverse areas such as occupational therapy (OT) (Rodger et al., 2013) and product design (Osmond, Bull, & Tovey, 2009).

Critique of threshold concepts, as described above, has provided a useful vehicle for debating the underpinning ideas and developing the theory, including how it might apply within the domains of research, learning and teaching. Such development has also been facilitated by the ways in which thresholds theory has been applied in a wide and diverse set of disciplines, practices and subjects areas since the original work (Meyer & Land, 2003). This has enabled different facets of threshold concepts to be explored from a range of disciplinary and methodological perspectives, including within healthcare and research education.

To supplement the literature review that was presented in chapter 2, a search for threshold concepts literature relevant to teaching research and EBP in healthcare was carried out to June 2014, using the online database of thresholds literature at University College London (UCL)¹⁴. Initially, 180 publications that were potentially pertinent to the study were identified and scanned for relevance. Of these, 50 were reviewed, which covered the areas of health and social care, identity, research education, numeracy and information skills. All relevant papers were included,

¹⁴ The database includes all publications related to threshold concepts, including conference papers and abstracts. The database is maintained by Mick Flanagan and hosted by the Department of Electronic and Electrical Engineering at UCL and can be found at <http://www.ee.ucl.ac.uk/~mflanaga/thresholds.html>.

whether they were research papers, theoretical articles or discussions, because of the fundamental importance of threshold concepts to the study.

Although no published work was found that has looked at undergraduate research education in healthcare, the threshold concepts approach has been used to study education in a number of healthcare disciplines, including nursing. The threshold concepts approach was identified as a useful means of exposing tacit knowledge and the hidden curriculum in occupational therapy (Barradell, 2013) and dentistry (Kinchin, Cabot, Kobus, & Woolford, 2011; Tsang, 2010, 2011). To a large extent, Tsang (2011) equates the hidden curriculum with threshold concepts in healthcare education, because of the troublesome nature of facets of professional identity that are not explicitly addressed in the curriculum, even though they may be transformative elements of becoming a healthcare professional. The troublesome aspect of the hidden curriculum is also reflected in the absence of ways of thinking and practising from healthcare curricula, despite these being fundamental to professional identities (Barradell, 2013).

Concerns related to professional identity are voiced frequently in the healthcare thresholds literature and this is a particular theme in OT. Rodger and Turpin (2011) distinguished professional identity as a threshold concept for undergraduate OT study and in a qualitative study to evaluate a revised curriculum based on threshold concepts, professional identity was found to evolve over time, with students changing their

discourse as they became an occupational therapist (Rodger et al., 2013). A similar theme emerged from another qualitative study in which clinical teachers reported professional identity as an area of ontological change for students during their OT studies (Tanner, 2011). This notion of professional identity as a threshold concept is extended by Nambiar-Greenwood (2010), who suggests that such a threshold also needs to link to conceptualisations of interprofessional learning within healthcare, because of the inherent need for healthcare professionals to work within multidisciplinary teams. Although different perspectives have been expressed and investigated relating to professional identity and ways of thinking and practising in healthcare, there does appear to be consensus among the different healthcare professions that professional identity is a threshold concept because of the trouble associated with acquiring this, as well as its transformative potential. Equally, ways of thinking and practising are also agreed to be thresholds (Meyer & Land, 2003), though the precise nature of these ways, including how they vary between professions, is not generally specified.

Professional identity as a threshold concept is not limited to healthcare and is relevant in other vocational programmes. Monk, Cleaver, Hyland, and Brotherton (2012) raised concern about the impact of a modularised and content-heavy curriculum on students' potential to develop understanding of professional identity in a course that prepares students for entering programmes of study for social work and child care. They suggest that the curriculum itself inhibited acquisition of threshold

concepts and a different perspective, but a similar outcome, is given by Stibbe (2011), who suggests that curricula for professional programmes may direct students towards professional attributes and identity, that reflect a particular world-view and that may be restrictive. Stibbe proposes that acquisition of a professional identity threshold may be achieved by teaching students about identity and how it can change according to societal and professional needs.

Some writers have noted the difficulty for educators in teaching threshold concepts in healthcare related to the novice to expert continuum and the paradox of teaching threshold concepts from beyond the threshold (Kinchin et al., 2011; Kneebone, 2009; Littlewood, 2011). This recognises the different perspectives of learner and teacher and may be a way of clarifying the trouble inherent in threshold concepts and then adapting approaches to learning and teaching to allow for this. For example, Kneebone (2009) suggests that simulation may be used to provide a less threatening environment for students learning surgical skills and to help to address the varying standpoints of learners compared to expert clinicians or educators. This idea of different perspectives is also apparent in some work suggesting that threshold concepts can help students to overcome negative attitudes, cultures and beliefs. In midwifery, Angell and Taylor (2012) positively evaluated a teaching intervention using threshold concepts to address negative attitudes towards breastfeeding. Then in mental health nursing Stacey and Stickley (2012) suggest that the ability of threshold concepts to proactively demonstrate sociocultural attitudes to

the concept of recovery may help students overcome the difficulty of learning about recovery.

Although different topics and concepts have been addressed in the theoretical and research literature about threshold concepts in healthcare, recurrent themes come through of threshold concepts being useful to address issues of professional identity, attitudes and beliefs and troublesome healthcare concepts. Alongside this, some other thresholds have also been proposed. Critical thinking and critical reflection have been identified as thresholds for nursing (Dearnley & Matthew, 2007) and OT (Rodger & Turpin, 2011). In the related discipline of social work, critical reflection has been identified as a threshold because of its role in transforming social work practice, including the continuum of student to practitioner (Foote, 2013). Critical thinking is accepted as necessary for ethical, safe and patient-centred professional practice across the health and social care literature (Price & Harrington, 2010). This makes it quite unsurprising that this is identified as a threshold concept, though some have identified problems with defining critical thinking, making the very term troublesome (Gupta, 2012).

More specific thresholds have also been identified. Clouder (2005) identified caring as troublesome, linked to differences between the concept of caring in everyday use and how it is conceptualised in professional practice. Perhaps more importantly, professional understanding of caring was also associated with changing professional

identity. Similarly, in the context of social work education, Morgan (2012) identified troublesome knowledge in students' interpretations of help for people with disabilities. This related to lay understandings of what giving help means, compared to professional definitions. These abstract concepts of care and help, as well as other thresholds identified in health and social care, such as interprofessional learning and critical thinking, point to a tendency in healthcare to identify thresholds that are grounded in professional practice and which are linked to ways of thinking and practising in healthcare generally or within the student's own profession.

In chapter 2 statistics and information skills were both identified as specific aspects of research that appear to be associated with learning challenges for undergraduate nurses. In the thresholds literature these challenges are confirmed, though from a different perspective. A survey of final year engineering students and their project supervisors identified three information skills thresholds, i.e. developing a search strategy, critically appraising literature and referencing skills (Yorke-Barber, Atkinson, Possin, & Woodall, 2008). The first two of these are closely related to difficulties nursing students were found to encounter and critical appraisal is also closely associated with the threshold of critical thinking identified in the healthcare thresholds literature. Library specialists have carried out other threshold concepts work relating to information skills, in which the thresholds and issues identified vary somewhat from Yorke-Barber et al. (2008), focusing on search processes and the structure of information and its sources, rather than on evaluating literature. Although expressed in

different ways, there is agreement that the ways information is structured and skills associated with developing searches are both thresholds for students generally (Brunetti, Hofer, & Townsend, 2014; Coonan, 2011; Tucker, 2013). However, there is relatively little evidence about how students manage these thresholds, although Blackmore (2010) suggests that a further area of difficulty may be that students' self-reported confidence in information skills is not matched by their competence when measured. This finding is supported by evidence reviewed in chapter 2 related to undergraduate nursing students (Jacobsen & Andenaes, 2011).

Statistics, or quantitative numeracy, has been put forward as a threshold concept, particularly for students in science based and professional disciplines, because of the anxiety and stress students experience related to statistical and maths elements of their programmes (LeBard, Thompson, & Quinnell, 2014; Quinnell et al., 2013). This suggests that the troublesome nature of statistics may relate to affective facets of the subject, rather than the knowledge itself. In the context of a study of medical students, LeBard et al. (2014) found that this may be further complicated for students on professional degree programmes, who perceive statistics as not being relevant to their discipline. Statistics is integral to the quantitative research process and consequently to learning in a range of scientific and professional subjects (LeBard, Thompson, Micolich, & Quinnell, 2009). Despite this, many students do not appear to view this area as a fundamental part of their chosen subject, which then poses challenges when they encounter statistics in the curriculum (Frith &

Lloyd, 2013). Quinnell et al. (2013) also identified this issue, concluding that becoming a numerate practitioner is part of the hidden curriculum and one that students may avoid engaging with. The literature in this area is uncontroversial in terms of the threshold and troublesome nature of statistics in academic disciplines, but it is less clear what solutions threshold concepts may be able to offer, particularly given the nature of the trouble that seems to relate to negative attitudes and perceptions of statistics.

Other aspects of research education have been explored in the context of threshold concepts. Much of this has focused on doctoral education and the thresholds that doctoral students encounter, including development of academic arguments, creativity and application of theory (Kiley, 2009; Kiley & Wisker, 2009). The literature in this area is usually concerned with processes of learning to carry out research, as well as the specific skills associated with producing a doctoral thesis, as exemplified by Trafford (2008), who suggests that development of a conceptual framework is a threshold for doctoral students. These thresholds are not strictly relevant to the context of undergraduate nursing study, because they link to the application of advanced skills in undertaking and writing up a research study.

A different perspective on doctoral education is considered by Guerin and Green (2012), who suggest the concept of voice as a threshold for doctoral students. For Guerin and Green voice relates to adopting the

discourse of the discipline, in the context of doctoral study and particularly in written form. It is troublesome because of the difficulty for students in knowing when they have acquired this voice, given that this aspect of learning may be part of the hidden curriculum. This idea of voice is similar to Kiley (2009), who proposes argument as a threshold concept. Both notions of voice and argument appear to incorporate the use of disciplinary discourse and thinking like a researcher. Although at a different educational level, discourse and terminology were also identified as problematic for students in some of the undergraduate nursing literature about research education (Ax & Kincade, 2001; Dobratz, 2003). This application of a threshold concept to different levels of education hints at the potential for some threshold concepts to be acquired to varying degrees of complexity, along a spectrum, depending on the needs and stage of learning of the student.

Most discussion and research work about research education focuses on doctoral students, but the development of hypotheses and testing of these has been investigated at the undergraduate stage (Taylor, 2006; Taylor, Tzioumis, Meyer, & Ross, 2014). This work is particularly interesting because using assessment of student understanding has enabled the precise nature of the trouble to be identified for this disciplinary group. Subsequently the curriculum was redesigned, to address the importance of the hypothesis in different aspects of experimental research designs, with encouraging results (Taylor et al., 2014). This highlights the potential usefulness of threshold concepts as a curriculum development tool in

research education, as well as pointing towards a future research focus that may place less emphasis on threshold identification and more on the effects of using thresholds to guide the curriculum.

In this study threshold concepts is the main educational theory underpinning the research and although all the features of threshold concepts have been considered, the focus is on four particular dimensions: transformative potential; troublesome knowledge; discourse; and liminal spaces. The transformative potential of threshold concepts is of interest in the study because of the regulatory requirement to use evidence in practice (Nursing and Midwifery Council, 2008a), as well as the move towards teaching research to undergraduate students in the context of nursing as a degree-based profession. The literature review presented in chapter 2 uncovered some evidence that nursing students find research and EBP difficult topics to understand (Ax & Kincade, 2001). Using the troublesome knowledge lens to explore and analyse the learning process aims to provide better understanding of why students encounter such difficulties and how these might be eased. This links closely to the discursive aspect of threshold concepts, which anticipates that students will adopt a new discourse. Particularly in learning about research, Ax and Kincade (2001) also noted that students find research terminology problematic, yet they need to assimilate this language, to become evidence-based practitioners.

The troublesome knowledge facet of threshold concepts has been integrated into threshold concepts theory, but the original work on troublesome knowledge pre-dates threshold concepts (Perkins, 1999) and has a set of ideas associated with it that are explored in the next section.

3.1.3 Troublesome knowledge

Troublesome knowledge was first conceived by Perkins (1999) as a theory of difficulty to explain the different ways in which knowledge can be problematic for students. Although troublesome knowledge was subsequently incorporated into threshold concepts (Meyer & Land, 2003), it was originally presented in the context of how a range of constructivist approaches to learning and teaching might be used to help students to overcome the different types of troublesome knowledge. Perkins (2007) specifies five types of troublesome knowledge:

- *Conceptually difficult knowledge* is hard to learn and complex
- *Ritual knowledge* lacks significance and there is usually little comprehension of how the knowledge can be applied
- *Inert knowledge* can be recalled passively in response to a specific question or context but is never transferred outside that domain
- *Foreign knowledge* may be counter-intuitive to students or seem strange, in the context of the student's existing set of knowledge and beliefs

- *Tacit knowledge* refers to the unwritten rules and language of a discipline, which may be hidden or untaught, but which are fundamental to the discipline.

Based on Perkins (2007)

Troublesome knowledge has been widely accepted within the threshold concepts literature but its scope has been expanded to mean any troublesome aspect of learning including knowledge and other factors. Blackburn and Nestel (2014), investigating troublesome aspects of paediatric surgical education found a range of factors that were troublesome to students, including negative experiences, relationships and clinical judgement, as well as knowledge. Similarly Taylor (2013) found that factors such as resilience could be troublesome in a childcare practice learning context. Although Perkins (2006) focuses on different types of trouble in knowledge, it is not surprising that this has developed, given the body of research and discussion around troublesome knowledge, that has been part of the threshold concepts field. The examples above from surgical and childcare education both relate to professional learning and this seems to offer a different perspective of troublesome knowledge. Although Perkins (1999, 2006) discusses troublesome knowledge in a range of disciplines, his examples are from traditional academic subjects and the application of threshold concepts to professional disciplines, as well as outside the HE arena, may be one contributor to the broader meaning of troublesome knowledge.

Troublesome knowledge has flourished in its adoption to threshold concepts, but the use of constructivism to address such trouble has received little overt attention. The approach described by Perkins (2006) as “pragmatic constructivism” (p44) was not just an important part of his argument, but also has the potential to contribute to both research and practice. Perkin’s pragmatic constructivism encourages the use of a range of approaches to address troublesome aspects of the curriculum and suggests using a suite of activities, based on how Phillips (1995) construed learners within constructivism, as active, social and creative. In terms of threshold concepts theory, this view of constructivism and its association with troublesome knowledge may also offer a way of making liminal space more accessible, by facilitating the student’s passage through it.

In section 3.1.2 the association of threshold concepts with the hidden curriculum was described. The hidden curriculum usually relates to elements of formal study that are not obvious to at least some students (Margolis, Soldatenko, Acker, & Gair, 2001); they lie “behind the scenes” (p3). In the troublesome knowledge framework, tacit knowledge, rather than the hidden curriculum, is identified as a component of troublesome knowledge (Perkins, 2007). Tacit knowledge refers to knowledge that may be owned by a community and tends to be associated with culture and identities, as well as being unstated (Toom, 2012). Originally developed by Polanyi (1966), tacit knowledge is important in professional learning because of the ways in which profession or community-specific (tacit)

knowledge is integral to the transition from novice to mastery of the profession and hence to professional identity (Poggenpohl, 2008). Indeed Berg (2008) suggests that tacit knowledge is particularly important to clinical practice because of the need for an equilibrium between “dialogue and technique” (p151), in other words between overt skills and competences and the unspoken ways of clinical work.

There are clearly links between the concepts of tacit knowledge and the hidden curriculum, but tacit knowledge is not specific to education settings, unlike the hidden curriculum. Although the hidden curriculum has been linked to threshold concepts in the literature, such as Quinnell et al. (2013), tacit knowledge seems to be a more natural bedfellow for troublesome knowledge and threshold concepts, because of its association with ways of thinking within professions and disciplines (Perkins, 2007). In the context of this study, which is centred on professional learning in undergraduate nursing, such links makes tacit knowledge a useful reference point. Tacit knowledge has also been linked with the specific discourses related to communities of practice, as described by Wenger, McDermott, and Snyder (2002). Communities of practice will be discussed further in section 3.1.5, but the synergy between tacit knowledge and communities of practice, as well as between tacit knowledge, troublesome knowledge and threshold concepts, make tacit knowledge a relevant perspective to include in the study’s theoretical framework. This appears to be a particularly significant component of troublesome knowledge, when looking at professional learning and identity.

3.1.4 Social development and the zone of proximal development

Tacit knowledge links, in part, to the history, culture and ways of working of a discipline or group, so it may be said to be context specific (Toom, 2012). The work of Vygotsky is also steeped in context, partly because of the social change he lived through in the years following the Russian revolution of 1918, as well as the subsequent impact this context appears to have had on his thinking (Gielen & Jeshmaridian, 1999). In this study, Vygotsky's work is of interest from two perspectives. Firstly his work on child development is credited with introducing social constructivism, which is characterised by knowledge creation occurring within social and cultural settings and influenced by other people (Hyslop-Margison & Strobel, 2007). Secondly one of Vygotsky's key contributions to education and psychology was his assertion that learning can precede development, rather than the reverse, which had been the prevailing understanding (Ivic, 1994). This idea forms the basis for his work on the zone of proximal development (ZPD), which Levykh (2008) refers to as the space in which a child can successfully carry out an activity with support from a more able person, compared to managing to complete the activity without guidance. This person is referred to as the more knowledgeable other, or MKO (Vygotsky, 1978).

From the perspective of the study, Vygotsky's work is not, at first, obviously applicable because of its focus on learning and development in children, though in *Mind and Society*, Vygotsky (1978) opens with the words:

The primary purpose of this book is to characterize the uniquely human aspects of behaviour, and to offer hypotheses about the way these traits have been formed in the course of human history and the way they develop over an individual's lifetime (p19).

Vygotsky's original work about the ZPD centres on child development, but others have taken this work forward to address learning and development in adults. John-Steiner and Mahn (1996) link the ZPD to learning communities and to constructivist notions of learning that is active and contextual. Another related adaptation of the ZPD is given by Lave and Wenger (1991) who focus on the ZPD as a space for "connecting issues of sociocultural transformation with the changing relations between newcomers and old-timers in the context of a changing shared practice" (p49). This idea of the ZPD occurring within a community of practice raises a question about the MKO. In the context of child development Chaiklin (2003) suggests that it is not the MKO's knowledge or understanding per se, that is critical, but the way in which this is used in the learning process. In adult education the MKO may still be someone who is better informed, but this enabling role for the MKO potentially opens the way for peer-to-peer or facilitator support. Lave and Wenger's characterisation of the ZPD also implies that in communities of practice the "old-timers" may also learn from social interactions and that it is not just those who know less who will learn. These interpretations of the ZPD make it a potentially useful tool for studying practice-based adult learning, within the context of communities

of practice, which are discussed below, as well as in exploring liminal spaces and transformation in threshold concepts.

3.1.5 Communities of practice

The concept of communities of practice has gained popularity across a range of disciplines since publication of seminal work by Etienne Wenger (1998). Communities of practice occur in all aspects of human activity and refer to groups of people who share a common interest, characterised by collective knowledge, practice and people (Wenger, 1998). Wenger goes on to place communities of practice within his social theory of learning, which includes four related components: “practice, learning as doing; identity, learning as becoming; community, learning as belonging; and meaning, learning as experience” (p5). This notion of social interaction within practice underpinning learning and identity formation resonates with Vygotsky’s work on the ZPD, introduced in the previous section. For Wenger communities of practice integrate the four components of learning, thus inherently linking development and understanding with identity, both individually and as a community (Wenger, 1998).

Work on communities of practice evolved from earlier work on situated learning and legitimate peripheral practice (LPP), in which Lave and Wenger (1991) proposed that practice is not just a facet of learning, but that learning is inherent in practice. In developing this, the idea of LPP was born. This suggests that communities need new entrants on the periphery who can fully engage with established community members to acquire the

knowledge and understanding they have, including tacit knowledge (Lave & Wenger, 1991). LPP was proposed as a way of updating and extending existing ideas of practice-based learning, which Wenger (1998) then developed further by focusing on the communities of practice themselves, as well as their effects on identity.

In the context of the study, work on peripheral participation in a community (Wenger, 1998) is highly relevant to the nursing student's relationship with the communities of nurses encountered in practice placements, who themselves are working among the diverse communities of the healthcare system. Wenger et al. (2002) suggest that boundaries exist alongside peripheral membership of communities and those boundaries are not always clear. Boundaries may be positive, in terms of helping to set the criteria for entry, but they can also be negative and Wenger et al. (2002) specifically note that discourse and terminology can be used as a way of creating a boundary that acts as a barrier to entry. In contrast, boundaries are also presented as having learning-rich potential, particularly in the context of boundaries between different communities (Wenger, 2000). This is of interest because the framing of boundaries as creative spaces for learning, as "sources of new opportunities as well as potential difficulties" (Wenger, 2000 p233) is reminiscent of the liminal space of threshold concepts, though communities of practice place more emphasis on the social nature of learning than threshold concepts, which tends to characterise liminal space in terms of individual students (Savin-Baden, 2008).

For Wenger (2000) identity is a fundamental aspect of both learning and communities of practice. He offers a different perspective on identity, compared to the ontological shifts that feature strongly in the conceptualisation of identity within threshold concepts literature. In this context, what Wenger refers to as “strong identity” (p240) is characterised by:

- Belonging and connectedness with others in the community
- Being part of different communities with different types of participation
- Inspiring achievement and giving power to act.

Based on Wenger (2000, p239-240)

Although identity is presented as developing over time, it is not clear how this might happen, particularly in the face of challenges, such as cultures that do not value learning, which Wenger et al. (2002) comment may be a problem associated with communities of practice. However this perspective of identity in communities of practice as being an on-going process that is rooted in practice gives a potentially useful way from which to evaluate students’ development and links to concepts of narrative identity, which is the focus of the next section.

3.1.6 Narrative identity

Theory around narrative identity has been included because of its influence on narrative research methodology, which is discussed in the next part of this chapter. Among others, Bruner, Ricoeur and Bakhtin have all influenced the development of narrative research (Riessman, 2008). Their work has informed the study because it is situated within what de Peuter (1998) describes as a relational interpretation of narrative identity. Broadly speaking this philosophical approach views identity as social and developed through interaction with others (de Peuter, 1998). It has strongly influenced narrative research, informing data collection and analysis concepts and methods, such as co-construction of meaning (Mischler, 1986) and dialogical narrative analysis (Frank, 2010; Riessman, 2008).

Bruner and Ricoeur, psychologist and philosopher respectively, put forward views that are very similar to one another, in their conception of life and narrative being fundamentally linked and of life being effectively without meaning, if it not narrated (Freeman, 2007). In the aptly named *Life as Narrative*, Bruner (1987) takes a constructivist view of narrative, which he sees as a way of “life-making” (p12). The consequence of this is that narrative and life become intimately interconnected, effectively one and the same, so that life does not have meaning separately in any objective sense, but is always an interpretation, retold in narratives (Bruner, 1987). Philosopher Paul Ricoeur critiques this perspective, based on the instinct that narrative is associated with fiction, so is in fact quite

removed from people's experiences (Ricoeur, 1991). However he goes on to argue that the meaning of fictional narratives lies not in written or spoken words, but in the way that the listener or reader interacts with the words. Extending this to people's lives, which Ricoeur describes as having a "pre-narrative capacity" (p27), narrative becomes the vehicle for making meaning from life experience. This end point aligns closely with Bruner's view that when human beings tell their life story, it is always reconstructed (Bruner, 1987). Indeed, in the end, both of these writers take the position that narratives give meaning to life (Bruner, 1991; Ricoeur, 1991). In the context of narrative research, this emphasises the interpretive nature of narratives. This relates to the ways that narrators are interpreting and retelling events and experiences within interviews, as well as the interpretive processes that researchers use when analysing data in narrative research.

Bruner (1991) explicitly includes a social or relational perspective to the way in which narrative gives life meaning, linking his theory about narrative to Vygotsky, specifically to the way that sociocultural factors influence how individuals construct meaning. In *Life as Narrative* (1987), Bruner refers to the ways in which narratives need to have shared understanding and rules among groups of narrators and those who hear or read the narratives. Later, he goes on to identify principles of narratives, one of which is "narrative accrual" (Bruner, 1991 p18). By this he means that a weight of narratives within a group or organisation (formal or informal) will over time result in norms or cultures. Such a view aligns well

with concepts of tacit knowledge and ways of thinking and practising within communities.

This fundamentally social view of narrative and its relation to life is seen from a different perspective in Bakhtin's work. Bakhtin views identity as being jointly constructed through dialogue with others and even dialogue with self, which he still views as dialogue between two voices (de Peuter, 1998). For Bakhtin all spoken and written words contain multiple voices, though much of his work was directed towards the novel and literary criticism (Steinby & Klapuri, 2013). For example, Bakhtin (1981), referring to novels, says that:

The author represents this language... all essentially
novelistic images share this quality: they are internally
dialogized images – of the languages, styles, world views
of another. (p46)

This image of the novelist in dialogue with multiple voices mirrors narrative methods through the way in which narrative researchers are situated dialogically with the voices of their participants, co-researchers and other voices in the research process. Frank (2010) suggests that this is a key component of understanding the multiple truths of narratives and Bakhtin's work has directly influenced the dialogical approach to narrative analysis, in which context, language and voice play an important role (Riessman, 2008).

These perspectives on narrative identity vary in the emphasis they place on different aspects of written and spoken narratives, but they all reflect a belief in the subjectivity of the narrative, the presence of different voices in narratives and the importance of narrative for giving meaning to experience.

3.1.7 Contribution of theory

Researchers bring theory to studies that they hold to be relevant to the topic being investigated (Freebody, 2003), but the choice of theory needs to be justified and congruent with the methodology, forming what was earlier referred to as a scaffold (Crotty, 1998). This chapter has described the theory used in the thesis to both frame the methodology and to help with the interpretation of the data. Reeves et al. (2008) advocate using theory to help with interpretation and provide a coherent framework. Since a range of theories has been drawn on to inform the study, particularly the interpretation, it is worthwhile considering why this particular set of theories is useful. In each of the sections, reasons for the choice of individual theories were presented, along with the key features of the theory, as relevant to this study. Social constructionism was identified as the macro theory for the study and this approach aligns closely with the narrative research methodology (Holloway & Freshwater, 2007). Although social constructionism is not always so closely aligned with the other theories used, it has strong links to constructivism, which is a theme that runs through all the theory included, though to varying degrees.

With the exception of narrative identity theory, the theories used all overtly link development and learning with identity and so are well suited to the study with its aim of examining students' difficulties in learning about research and EBP, as well as the potential transformation that learning might have. The theory relating to narrative identity is similar to the others in that it aims to help with interpretation, but in a rather different way. Narrative identity theory has helped to bring to the foreground the nature of narratives as: situated; dialogical; subjective; and interpretations of events and experiences. It therefore helps with interpreting *how* narratives were told, *by whom* and *in what context*. The other theories are mainly used in the interpretation to help with examining *what* was told, as a way of understanding the meaning of the students' narratives.

The theories included were all chosen because they offer the potential to help unravel and disentangle the data in such a way as to arrive at a meaningful and trustworthy interpretation. In the next section the narrative methodology is explored, including its provenance, key principles and application to the study.

3.2 Part II: Methodology

The methodology and theory form a partnership aimed at meaningfully answering the research questions. The theoretical framework explored in the previous section included work on narrative identity, which relates directly to the narrative research methodology that is the focus of this part of the chapter. The other theories included are less overtly linked to the

methodology and although the theoretical framework does not dictate the choice of methodology, there needs to be congruence between them. Crotty (1998) describes the theoretical framework as the “assumptions” or “stance” that are the backdrop for the methodology (p7). The methodology then provides a recognised strategic approach within which a study is developed and in this section the choice of narrative research is discussed, including its principles and features.

3.2.1 Rationale for qualitative methodology

Educational research has a well-established history of qualitative research, in common with other social sciences, such as psychology, anthropology and sociology (Sarantakos, 2005). Qualitative research does not lend itself to a precise and clean-edged definition, because of the multiplicity of philosophies and schools of thought that underpin it, as well as the array of methods that it is used to describe (Denzin & Lincoln, 2013a). Although it is beyond the scope of this thesis to examine debates about the nature of qualitative research, it is nevertheless useful to consider its key principles, to help explain why the study took a qualitative approach.

The most obvious principle of qualitative research is that, unlike its quantitative counterpart, measurement and numeric data are rarely used and most qualitative data is text-based, though increasingly other forms of data, such as video and imagery are being studied (Gourlay, 2010).

Typically qualitative studies are also small-scale in terms of the numbers of participants, compared with their quantitative counterparts (Cohen et al.,

2011). However they are far from small-scale in terms of the volume of data generated. Even one of the shorter interviews in this study resulted in over 6000 words of data and from these 11 separate narratives were identified. In gathering qualitative data researchers aim to capture a reality of experiences and events situated in the unique perspective of the participants and with a focus on the details of human phenomena (Silverman, 2010). Interviews are a common tool for collecting qualitative data, but the approaches to analysing data are varied, though broadly speaking these aim to develop understanding of a topic and its meaning, within the context of the research (Topping, 2010).

The decision to take a qualitative approach in this study was based on the potential for the broad principles outlined in the previous paragraph to answer the research questions. At a macro level, the study focuses on undergraduate nursing student learning about research and EBP. More specifically the study explores difficulty in learning about these topics, how students manage all aspects of their learning, the changes and transformations they undergo and the threshold concepts they encounter. Qualitative research is more appropriate, because detail and examples of the students' experiences are needed to answer the research questions. This includes their reflections and interpretations of their learning experiences. Additionally, the interpretive nature of qualitative research, that can explain and infer meaning from the students' words, is better suited to fully address the issues of difficulty and transformation.

3.2.2 Introducing narrative research

The study employed narrative research, using threshold concepts as the principal theory to underpin the study. The following sections begin with setting out what narrative research involves, its strengths and weaknesses and how it has emerged as a method of inquiry. Narrative research is then considered in the context of this study, including what made it the methodology of choice over other qualitative approaches. Narrative research will be used to describe the methodology of the study throughout, though the term narrative inquiry is also commonly used. This choice reflects the context of the study, within a postgraduate research degree, making it more apt to use “research” with its corresponding values.

3.2.3 Exploring and defining narrative research

A natural starting point for reviewing narrative research is to provide a definition, yet narrative research is not easy to specify, with no consensus on approaches and methods within the field (Squire, Andrews, & Tamboukou, 2008). Nonetheless, a scan of texts about this methodology reveals general agreement that it is broadly concerned with collecting and analysing stories or narratives that shape and retell all aspects of individual and social lives, including events and experiences. Narrative researchers often use the terms story and narrative interchangeably, though some have differentiated between the two. A useful distinction is provided by Polkinghorne (1988), who describes a story as the output, the end result of events or experience being told, whereas a narrative can be wider than this, encompassing the thought processes and ideas that

influence or underpin the story. In this thesis narrative has been mostly used, rather than story. This choice reflects the wider sense that Polkinghorne identified for narrative and because story tends to be associated with retelling events, whereas narrative – including the narratives gathered in this study – may refer to accounts of both events and experience.

Riessman (2008) identifies a feature of narratives that is important in collecting and analysing narrative; they are representations of the narrator's interpretation of events and personal experiences. These are presented in the context of where, when and to whom the narrative is being told. In-depth narrative interviews are the most common approach to data collection and the interview approach is usually flexible, adaptable and elicits examples and specific events from the participant (Chase, 2013). The frequent use of unstructured interviews is one of the defining characteristics noted by Chase (2013), who also suggests that, in narrative interviews, the participants are encouraged to give detail and examples, rather than to generalise. Both the data collection and its interpretation are affected by the relationship between the narrator and researcher, through what Mischler (1986) refers to as a "joint construction of meaning" (p52). Additionally, the researcher's individual perspectives, beliefs and values also need to be acknowledged and taken into account, making reflexivity another important consideration for narrative researchers (Cousin, 2009).

The narrative approach to interpreting data is quite different from other qualitative methods, as it uses each narrative as the unit of analysis and usually includes other features of the narrative in the analysis, such as structuring, context of the interview and co-construction of meaning between interviewer and participant (Horsdal, 2012). Analysis of narrative interviews is not particularly well defined and, for a novice narrative researcher, this is perhaps both the difficulty and appeal of narrative analysis. It is a flexible approach, characterised by an absence of fixed frameworks, though some established narrative researchers have categorised approaches to analysis (Taylor & Francis, 2013). In this thesis, Riessman's representation of interpretation has been used and this is discussed later in this section (Riessman, 2008).

The roots of narrative research can be identified in the work of philosophers and psychologists, notably Jerome Bruner and Paul Ricoeur. As discussed in section 3.1.6 Bruner argues that our lives are given meaning not by experiences or events as such, but through the way in which we interpret and re-tell them as a narrative (Bruner, 1987). This idea is borne out in narrative research, such as Williams (1984), who studied the ways in which chronic illness, its causes and consequences are explained by individuals in terms of their life experiences and beliefs. Similarly, Ricoeur (1991) argues that narrative is an integral part of human experience, that "life is a story in its nascent state" (p29) and that narratives can draw together disparate aspects of a life into a cohesive

whole. Narrative research is therefore rooted in this understanding of the importance of stories in making sense of life.

Narrative research, and specifically narrative analysis, initially emerged as a methodological approach in the late 1960s with the definitive work of Labov and Waletzky on narrative structure (Labov & Waletzky, 2003). Riessman (2008) points out that Labov and Waletzky's work remains a "touchstone" for the tradition of narrative research (p15). Their work derived from linguistics and centred on deconstructing narratives into a set of discrete but related units. The sequencing of the narrative as events in time is also critical in their work. Labov and Waletzky's work remains influential in the development of narrative research, and the principles of this approach are recognisable today in the structural approach to narrative analysis (Riessman, 2008). However, this approach is largely concerned with analysis, rather than the research process as a whole. It is also restrictive in defining a narrative as a chronological series of related events or incidents (Patterson, 2008), presenting a specific and controlled way of analysing narratives.

Some of the most significant work to develop the narrative research method has focused on experience-centred narrative, rather than emphasising the grammatical, chronological structure of a narrative (Squire, 2008). Squire identifies experience-centred narratives as stories that do not necessarily retell specific events but which may disclose a key aspect of the storyteller's identity, life experience or world view. She

suggests that such narratives also demonstrate the shifting and nebulous character of stories, which can be retold in different ways, separated from the actual events or situation being described. Four assumptions can be identified in experience-centred narratives, which:

- Are sequential and meaningful
- Are definitively human
- “Re-present” experience, reconstituting it, as well as expressing it
- Display transformation or change.

(Squire, 2008 p42)

These features offer a framework within which to investigate narratives of personal and social experiences such as learning, illness or political activism and this conceptualisation of experience-centred narrative forms the basis for the narrative work undertaken in the study. The experience-centred narrative aligns well with threshold concepts particularly in its concern with transformation, but also in the ways that both the liminality of thresholds and narrative accounts focus on the detailed and individual experiences of learning.

Narrative analysis has developed considerably over time, but whatever the approach, the focus is placed on the story as the unit for interpreting meaning. This enables the voice of the narrator and context of the narrative to come through, facilitating what Frank (2010) refers to as “letting stories breathe” (p2). Drawing on the work of Vygotsky, Moen (2008) suggests that narrative analysis embraces the entirety of a

narrative, avoiding loss of meaning that may result from breaking up the narrative into small, disassociated parts. Apart from this story-based approach to analysis, flexibility and adaptability characterise the analysis process and Moen (2008) suggests that theory is important to help to guide the analysis in a structured way ensuring that it is credible.

Riessman (2008) has identified three approaches that form the mainstream in analysing text-based narratives: structural, thematic and dialogic analysis.

Structural analysis was described above and was central in the early development of narrative analysis. As the methodology has matured, some narrative researchers have adopted a thematic analysis approach (Williams, 1984). This has elements in common with traditional qualitative thematic analysis, but identifies a story or episode as a unit, rather than coding and categorising words or phrases. Thematic narrative analysis may also evaluate the choice of language and how experiences are described, including what the narrator chooses not to tell about an experience and the interaction between interviewer and interviewee (Riessman, 2008). A third approach, dialogic or performance analysis, is described by Frank (2010) as a way to “expand the listener’s openness to how much the story is saying” (p88). The approach can legitimately include different perspectives or lenses in interpreting a narrative, but it explicitly takes account of the different contexts within which a narrative is told.

Narrative analysis is therefore varied and flexible and these three broad categories of analysis are not mutually exclusive (Riessman, 2008). Indeed part of the appeal of the narrative approach is that it lends itself to examining narratives from different perspectives, depending on the context of the narrative and the research work. However, broadly categorising thematic, structural and dialogic analysis as three strands of narrative analysis is helpful in selecting appropriate ways of analysing data, dependent on the needs of the research study. Any narrative analysis needs to acknowledge the context of narratives and accept the inability to grasp a single truth or a definitive, immutable experience. In fact narrative research can enable researchers to let go of a unique truth and to focus instead on the process of experiencing a life event or experience (Horsdal, 2012). This also opens up the opportunity to re-examine narrative data from a different perspective at a different time, as described, for example, by Clandinin and Connelly (2000).

The development of narrative research reflects the range of disciplines and researchers using the approach. Stories, by their nature, are of interest in a wide range of contexts and this has brought the multiplicity of approaches to collecting and interpreting data in current narrative research (Holloway & Freshwater, 2007). Within HE, Cousin (2009) concludes that narrative research can be a useful approach to investigate students' experiences of aspects of their learning and to examine progression in learning. Educational research, whatever the methodological approach, centres around social and essentially human issues and can be viewed as

having moral, social, philosophical and political aspects, with researchers overtly coming to research with their own beliefs and values (Sikes & Goodson, 2003). Narrative research is also focused on human experiences and the position of the researcher, as an active participant, whose own ideas and attitudes are acknowledged, means that narrative research aligns well with the values of educational research.

With a foot in two disciplines, nursing education research straddles the traditions of nursing and educational research and is also influenced by education and research traditions in other areas of healthcare, notably medicine. From the perspective of nursing, the narrative approach has not been widely used (Holloway & Freshwater, 2007). A scoping search of the narrative research literature in nursing education found that, despite relatively little narrative research work, there has been a growing interest in narrative over the past 20 years. A combined search of the British Education Index, the Australian Education Index and ERIC¹⁵ found 47 articles published since 1990, looking at narrative and nursing education. Thirty-four of these were published during or after 2000. Some of these articles examined the use of narrative in nursing curricula, rather than using narrative research to study nursing education and these different, but related, uses of narrative in nursing help to highlight an alignment between narrative research and nursing education. Holloway and Freshwater (2007) describe the changes in nursing and nursing education towards a person-centred way of working that emphasises the patient's

¹⁵ The Education Resources Information Center (ERIC) database is provided by the US Department of Education.

expertise and narrative as a way of understanding individual lives. A methodology like narrative research is then well suited to examining and understanding students' experiences of learning, through their learning narratives.

3.2.4 Strengths and weaknesses of narrative research

In general terms, narrative research attracts criticisms similar to other qualitative methods. Critics claim that qualitative studies lack objectivity and are not scientific, generalisable or rigorous, arguments that Denzin and Lincoln (2013b) position in the political landscape of Western, positivist research. In the US in particular, qualitative educational research has been maligned, partly because of policy and political views (Barone, 2010). A further reason for the denigration of qualitative research, noted by Denzin (2008), is the rise of the evidence-based medicine movement in the 1990s, which valued and promoted deductive research methods and then spread beyond medicine to other professions, including education. This is naturally a point of particular interest, because of the collision here of the subject matter of the thesis with a critique of the method employed. Although within medicine there remains a very strong tendency towards quantitative research, qualitative research is becoming more valued, particularly as a complement to quantitative approaches (Greenhalgh, 2014) and within both nursing and education the existing body of qualitative research speaks to a wider acceptance of qualitative methods.

Like other qualitative methods, narrative research is subjective, from the perspective of both participant and researcher. This is a potential weakness, if subjectivity is not acknowledged or clouds the interpretive process. Subjectivity can be at least partially addressed through reflexivity, which enables the researcher to identify and take account of personal perspectives, beliefs or attitudes (Elliott, 2005). Where narrative research differs from other qualitative methods is in the absence of defined models to direct the data analysis process in particular. This results in the diversity of approaches, described in the last section, that Riessman (2008) refers to as a “family of methods” (p11). This is potentially a significant weakness for narrative research, as it can result in interpretation and conclusions that are misleading or lack authenticity. To avoid this, care and attention to rigour are required. Allowing for this, the flexibility in analysis can be a strength of narrative research, since it enables researchers to adopt a method of analysis that suits the context of a study.

Chase (2013) notes another weakness linked to narrative methods, related to the potential difficulties for researchers in interpreting data they were themselves involved in shaping. This is a particular issue in narrative research because of the usually unstructured nature of narrative interviews. However the freedom of unstructured interviews, combined with the overt acknowledgement of the researcher’s position in the interview, can be strengths of this approach, because the analysis process can take account of such factors. Elbaz-Luwisch (2010) refers to “the wakeful narrative inquirer” (p274), who takes into account not just the

context of the interview, but a wider context and positioning within social spaces and communities. The higher level skills required for narrative interviewing can also represent a weakness of narrative research, particularly because of the unstructured nature of the interview. These skills include interacting sensitively with the narrator to elicit stories and allow the interview to progress naturally, while maintaining focus (King & Horrocks, 2010). This can make narrative interviewing challenging, particularly for novice researchers, so preparation for the narrative interview becomes particularly important and Kim (2011) has recommended a pilot phase as a way of developing interview skills.

Some researchers have raised concerns over ethical issues in narrative research, relating to the need for longer sections – perhaps a whole narrative – to be included to illustrate the interpretation (Chase, 2013). This may be particularly problematic when a participant's narrative is being included for its unusual or unique qualities, meaning that it could be recognisable to those reading a research report or article. Additional ethical issues raised by Smythe and Murray (2000) relate to ownership of the narrative, the multiple interpretations possible and to potential vulnerabilities in the participants. These concerns are strongly linked to life story narrative and the anticipation that narratives might cover painful and difficult topics. Although learning narratives may have this potential, studies of student learning are less likely to pose this problem than personal life narratives.

Narrative research has a particular strength in the detail, variety and richness of the data collected (Chase, 2013). Individual, unique experiences and events are essential to narrative research and narrative research reports will often focus on a very small number of cases, as, for example, in Bignold and Su (2013) who used only two cases. Within the context of HE, this gives the potential to explore the range and difference of learning experiences, as well as differences in students' perceptions, attitudes, feelings and beliefs. A further distinguishing feature of narrative research relates to recognising the contexts of the research, which can then be incorporated into the narrative analysis (Frank, 2010). This strength is particularly relevant for dialogic approaches to interpretation that Riessman (2008) refers to as being a method that "asks 'who' an utterance may be directed to, 'when,' and 'why,' that is, for what purposes?" (p105). For an interpretive method, like narrative research, the overt inclusion of the situation of an interview can help to make the interpretation more trustworthy.

3.2.5 Application of narrative research in the study

Above all and at its simplest, narrative research was selected for this study because of its potential to answer the research questions. These questions look for detailed and varied information about how students find learning about research and EBP, specifically the difficulties they encounter, the thresholds they cross and what sorts of changes and developments they undergo. Narrative interviews were well suited to the study because the students had the opportunity to present their particular

stories in their own ways, with no expectations of particular content or answers. This approach also offered the opportunity to gather data that would demonstrate the range and complexity of learning, by analysing not just what the participants described, but also how experiences were retold, choice of language and other aspects of the discourse.

A further important reason for choosing narrative research was its synergy with threshold concepts. Threshold concepts have been investigated using a range of quantitative and qualitative methods, but in this study narrative research aligns particularly well. This relates to the potential for narratives to describe the process of learning, from the initial encounter with a threshold and subsequent negotiation of the liminal space. The use of two interviews in the study gave the opportunity to explore how much transformation students had experienced. The spectrum of experience and diverse perspectives on learning that are possible in narrative interviews lend themselves well to exploring the range of ways in which students experience learning about research and EBP, particularly the troublesome aspects of it.

The choice of a qualitative approach has been discussed earlier and other qualitative methods were considered, two in particular. Grounded theory was reviewed initially as a possible method, because of the lack of existing evidence on the topic and the nature of this approach, in which the researcher uses open coding to develop meaning and theory through the research process (Polit & Beck, 2012). However the theory-building nature

of grounded theory, that is fundamental within different approaches to grounded theory, was not congruent with the research questions. These questions already had a theoretical basis in threshold concepts and they actively look for the different ways that students manage learning, rather than developing constructs around research and EBP in nursing education.

The other potential research method was interpretive phenomenology, which has been widely used in social science disciplines, including education, and which focuses on developing understanding of a phenomenon through rich description and lived experience (King & Horrocks, 2010). Although interpretive phenomenology has some features in common with narrative research, there are key differences. Particularly important for this study is that narrative research stresses the importance of the continuum and changes over time, unlike phenomenology (Lindsay, 2006). Additionally, Lindsay identifies that, in narrative research, the individual participants' experiences are preserved in the interpretive process, whereas phenomenology looks for commonalities among the participants. These factors of time and individual cases make narrative research a highly suitable method for investigating student learning about research and EBP, particularly in the context of threshold concepts, as noted above.

Narrative methods were employed in both data collection and analysis. In depth, unstructured interviews were chosen to collect narrative data, in the form of experience-centred narratives and based on the principles

described by Squire (2008) in section 3.2.3 above¹⁶. Experience-centred narratives were appropriate for the study because the students were being asked to recall and reflect on their learning experiences, both in a research and EBP module, as well as through their university study. They were also a suitable choice because degrees of development and change were at the heart of these learning narratives. The unstructured nature of narrative interviews also provided flexibility to allow unforeseen and unexpected aspects of experiences or phenomena to be explored (Mischler, 1986). The data was then analysed using a combination of thematic and dialogic narrative analyses, as described by (Riessman, 2008). The main analysis was thematic, in which the focus was on what was told, though with some consideration of dialogical perspectives, such as who was speaking and to whom, which helped to enrich and deepen understanding of the themes.

The data collection and analysis are discussed in more detail in section 3.3, but the different approaches to analysis in particular and the range of disciplines that narrative researchers come from, can make this a difficult landscape to negotiate. This applies particularly to the perspective of a novice undertaking a narrative study. However, it is also a highly appealing approach because of the potential to explore students' learning in depth and to gather vignettes and examples of their learning. In the context of nursing students' learning about research and EBP, such detail

¹⁶ These principles are: sequential and meaningful; definitively human; re-presenting experience, reconstituting it, as well as expressing it; displaying transformation or change (Squire, 2008).

is largely absent from related literature. Using narrative research in this study therefore offered the potential to explore these students' learning using a different approach that had potential to reveal detail and in-depth understanding of undergraduate research and EBP education in nursing.

3.2.6 Rigour in the study

The notion of truth is a recurrent one in qualitative research and there is a general acceptance that the idea of a single and absolute truth is not possible, nor desirable (Richards & Morse, 2013). In narrative research, the concept of truth is associated with being socially constructed (Lincoln, Lynham, & Guba, 2013) and the notion of multiple truths from a single narrative is also widely accepted (Andrews, 2008). Freeman (2007) puts forward the view that the prime objective in narrative analysis should be to interpret and animate what is told, to make sense of the narratives, rather than trying to present them as verified and real. In trying to better understand learning thresholds and difficulties in learning about research and EBP, these ideas are more meaningful than a search for a truth, or even a consensus of views, perspective and experience among participants. This is because it is easier to acknowledge the varying needs students will have when learning about threshold concepts, when different views and perspectives are acknowledged.

There is no single framework for assessing quality in qualitative research and the debate goes on about how and whether the fundamentally quantitative terms validity and reliability should be transferred to qualitative

research. Elliott (2005) argues that qualitative researchers must still ensure that studies “are ‘accurate’ or ‘valid’ representations of reality” (p22), but in narrative research the very concepts of reality, accuracy and representation are so unlike positivist definitions of these that the use of validity, reliability and bias seems misleading. To address similar concerns, Lincoln and Guba (1985) proposed a framework for evaluating quality in naturalistic research studies that is widely used and well established. They identify trustworthiness, rather than truth, as the way in which we should evaluate quality in qualitative research and four aspects of trustworthiness are identified: credibility, transferability, dependability and confirmability (Lincoln & Guba, 1985).

Although these criteria for trustworthiness are widely used, they are not ideal for evaluating narrative studies and some are incongruent with specific principles of narrative research. In particular, this applies to techniques associated with credibility, such as member checks, and dependability, such as “stepwise replication” (Lincoln & Guba, 1985 p317). In narrative research, the inherent veracity of a narrative, told at a point in time, to a particular person or people and situated in a specific context, is very important, as well as the central, acknowledged position of the researcher in the narrative. Addressing such concerns, Riessman (2008) has proposed a set of criteria for assessing quality in narrative research. The disadvantage of these is that they have not been widely applied, but their choice reflects their specificity to narrative research and their adaptability to the context of a narrative. The criteria are set out in figure

3.2. The application of these criteria to the study is considered in chapter 5, but a brief explanation of how each of these has been used in the study is set out below, based on Riessman (2008).

Correspondence evaluates the way that interpretive work is grounded in the narratives. This could be, for example, the fit of excerpts from narratives with the themes or interpretations to which they are being linked. Persuasiveness is concerned with how well the recorded processes of the research study match with principles of narrative research, including alignment between different aspects of the research process. The third criterion of ethical change is referred to by Riessman as “political and ethical use” for “social change” (2008, p196), but for this educational study, the criterion has been adapted and refers to the potential of the study to meet an ethical commitment for research to contribute to the evidence base and to continuing debate and development in the area of study.

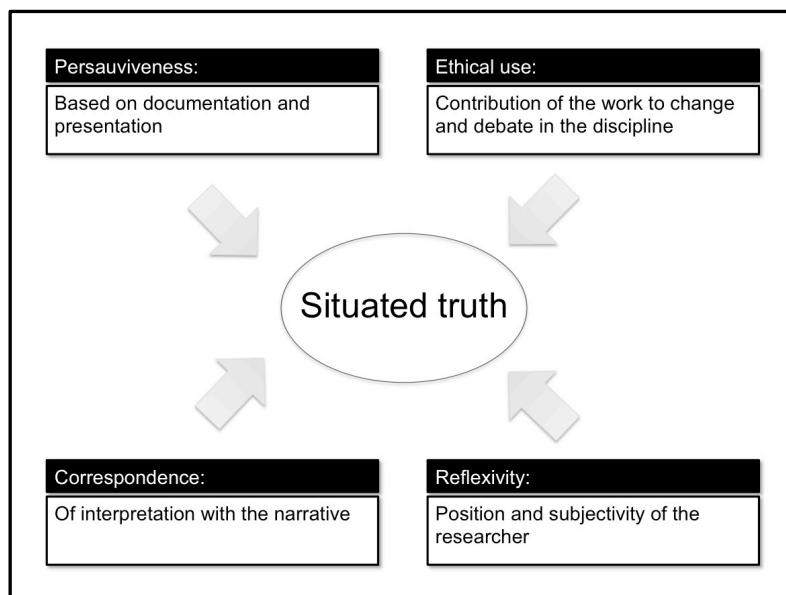


Figure 3.2: Quality criteria based on Riessman (2008)

Riessman (2008) does not include reflexivity as a criterion of rigour, but she refers to the need for reflexivity and it is widely acknowledged that this is an important aspect of qualitative research (Bradbury-Jones, 2007; Cousin, 2010). Reflexivity is about the researcher's awareness of his or her subjectivities and position in the context of the research and Lincoln et al. (2013) present this as an active and demanding process of self-questioning that permeates the research process. The ability to continually self-assess, reflect and review has been included as an important quality criterion in the study, because a reflexive approach helps to enhance the integrity of the interpretive process and contribute to meaningful interpretation of the narratives (Bradbury-Jones, 2007).

An account of reflexivity and its effects through the study is included in chapter 5. Reflexivity is, by its nature, highly personalised, so although the thesis has been mostly written in the passive voice, the reflexivity section of the discussion is written in the first person, because it is a personal account, that focuses on position, subjectivity and self-review.

3.3 Part III: Methods and design

The methods follow directly from the methodology and need to demonstrate congruence in the approaches to sampling, data collection and data analysis (Sarantakos, 2005). Unlike quantitative approaches, qualitative methods often develop over the course of the study, with the next steps dependent on outcomes from previous ones (Punch, 2006). In this study a pilot preceded the main study, to both pre-test the methods

and strengthen the rigour of the research. This meant that the methods were relatively stable over the course of the study. The main study was largely the same as the pilot, though the approach to sampling was changed with the aim of improving recruitment. This part of the chapter shows how the narrative methodology was applied to the study, to explore the challenges students encountered in their research and EBP learning.

3.3.1 Developing the study: the pilot interviews

Although piloting is much less common in qualitative research than in quantitative studies it is potentially useful to a researcher and Kim (2011) identifies three areas that can be positively influenced by qualitative pilot studies, namely feasibility, pre-testing and researcher development. Given the absence of any previous thresholds studies looking at acquisition of research and EBP skills in undergraduate nursing students, conducting pilot interviews was considered to be potentially informative for the main study, as well as offering a useful way to develop narrative interviewing skills in preparation for the main study. The pilot interviews were held over the period September 2011 to January 2012 and aimed to:

- *Pre-test* the proposed method and narrative approach
- Test the *feasibility* of the main study by generating preliminary data to inform the discussion topics for the main study
- Develop *researcher skills* in narrative interviewing.

3.3.1.1 Sampling and Recruitment

The pilot aimed to recruit a convenience sample of three students, who were taking an introductory healthcare research and EBP module in the first semester of 2011/12 (September to December).

All 308 students taking the module were initially alerted to the study through an announcement posted on the University's virtual learning environment (VLE) site for the module. The participant information sheet was attached to the announcement (appendix 3). The module leader also told the students about the study during a face-to-face session and students were directed to contact the researcher by email, if interested. A follow-up email was sent to all students on the module a week after the initial announcement, again including the participant information sheet. Only two students responded to the call, so the pilot went ahead with these two participants. Both students gave consent to take part and the consent process is described in greater detail in section 3.3.3.2 below. It was made clear to those participating in the pilot interviews that they were being recruited to the pilot phase, though it was explained that the data they provided might be included with the main study data.

3.3.1.2 Data collection

Data was collected over two narrative interviews; one just after the beginning of the module and the other after the module was completed. Both students took part in the two interviews and through both of these the students were asked to try to think of examples and illustrate points made.

In the first interview students talked about experiences of research and EBP over the first two years of their nursing course and their expectations and feelings about undertaking the module. Prior to the first interview a broad schedule of potential question areas was identified (appendix 4), that was based on: existing evidence in this area; personal knowledge of the module content and course curriculum; and the threshold concepts framework. Briefly, the key areas to be explored were:

- General orientation and feelings about research and EBP
- Prior experience of learning about research and EBP
- Experience of research and EBP during practice placements
- Reasons for undertaking the module; thoughts and expectations about the module and about its relevance for nursing.

Email was used to make arrangements to meet up with the students. The interviews were arranged for a date and time to suit the students and were held in meeting rooms on campus. One of the students was based at the main university campus and the other at the satellite campus. The interviews took place in the student's "home" campus and were recorded using two digital voice recorders. Holding the interviews in the university ensured that they were in a private location, as both campuses have quiet and comfortable meeting rooms that can be booked.

At the beginning of the interviews, to help them to feel relaxed, the students were asked to confirm their age, year and field of study. They then talked about what they had done before coming to university and

their reasons for choosing to become a nurse. The rest of the interview continued using an unstructured approach, based on the question areas in the schedule. The students spoke freely and gave detailed responses to all the question areas. At the end of the interview the students were reminded that they would be contacted once the module was completed to invite them for a second interview.

The students were contacted again by email shortly after the assignment work submission date. As before, arrangements were made by email and meetings held on campus. The interviews took place four weeks after the end of the module because of a holiday period and also because the students were out on a clinical placement at this time, which meant that they were not regularly on campus.

Another schedule of question areas was developed for the second interview (appendix 5). This took account of the data from the first interviews. The second interview focussed on:

- Experiences of the learning process during the module
- Approaches to studying and learning, including managing learning online
- How the module assignment was planned for and written
- Thoughts about using research and EBP, including changes in views and links to becoming a nurse
- Aspects of the module that had been difficult or challenging, including terminology and discourse.

3.3.1.3 Data review

The interview recordings were transcribed verbatim. No transcription services were used and although this made the process very time-consuming, it was also helpful, because it was an important part of the familiarisation process, through absorbing the words and language used, as well as the ways in which the students talked about their experiences. Notes were made about the interviews and the narratives. These were used to inform the interview schedules and technique for the main study, but no formal narrative analysis was done at this stage.

3.3.1.4 Outcomes of the pilot study

The pilot interviews pre-tested the narrative method of data collection, as a way of investigating student learning about research and EBP. The interviews were 40-60 minutes long and provided detailed and relevant information. They demonstrated that the students were willing to tell their stories and also helped to define the role of the researcher, primarily as a listener, but also to probe and explore specific issues, examples and stories. The pilot also helped to confirm that this approach, using one to one narrative interviews at the beginning and end of the module, yielded positive responses. However convenience sampling was not felt to be transferable to the main study. Of 308 students enrolling on the module, only two volunteered to be interviewed. In the main study a minimum of 15 students was required, so the sampling approach was changed to simple random sampling to take account of this (see section 3.3.2.3 for more detail).

The pilot confirmed that it was feasible to gather data that could answer the research question. The interview data showed that students were able to discuss their learning experiences in detail and in a way that addressed issues of difficulty, both directly and indirectly. The use of two interviews provided narratives about change and transformation in the students' learning and understanding. The data gave insight into these students' experiences, which led to two specific refinements to the interviews in the main study. The first related to practice placements, as many narratives emerged about these experiences in the first interview. The other centred on eliciting students' conceptions of research and EBP (individually and in comparison). The unstructured and in depth nature of narrative interviews meant that no other changes were required as the interviews were adaptable enough to follow experiences of interest.

A further consideration for the pilot was the development of qualitative, specifically narrative, research skills. The role of the interviewer in narrative interviews is very important and undertaking an unstructured interview requires expertise (Bell, 2010), so pilot interviews are particularly useful for novice researchers to help develop the skills required to listen and elicit rich and relevant narratives. These interviews gave insight into the researcher / participant roles during the interviews, as well as helping to identify ways to access students' narratives of all aspects of their learning experience. This happened through doing the interviews, but interview skills were also developed through transcribing and listening to the interviews and particularly interaction, interruptions, manner and

choice of language. Writing down personal reflections after the pilot interviews was also found to be another useful way of developing interview skills in preparation for the main study, which is described in the following sections.

3.3.2 Sampling and recruitment

3.3.2.1 Setting and target population

The study took place in a university in the UK that delivers undergraduate nursing education on two sites. One of these sites is the main campus in a small city, where most other university departments are based. The other site, in a town some distance away, is a satellite campus that only accommodates nursing students. Most students are based on the main campus. The target population was identified as undergraduate students, studying adult nursing, who would start a module in research and EBP during their third year of study between January 2012 and January 2013. This covered two cohorts of students. The first (n=51) was based at the satellite campus and started the module in January 2012. The other (n=223) was based on the main campus and started the module in November 2012. This gave a total target population of 274.

3.3.2.2 Inclusion / exclusion criteria

Prior to recruiting students, inclusion and exclusion criteria were applied.

Inclusion criteria were:

- Third year undergraduate nursing students at the study sites
- Students opting into degree modules in their final year, to complete a degree programme, rather than a diploma
- Students studying the adult nursing field.

Exclusion criteria were:

- Students opting out of the degree programme (i.e. planning to exit with a diploma)
- Students from children's and mental health nursing programmes.

The students in these cohorts were originally admitted to a pre-registration nursing programme, but all students entering third year were offered the option to graduate with a BN degree, if they completed two additional 30 SCQF credit modules at level 9¹⁷. One of these modules is the introductory research and EBP module, so only students who had opted to complete the BN degree were eligible for the study.

In the pilot study all students enrolled on the module in semester 1 2011/12 were invited to participate, which included any field of nursing (adult, children's and mental health). However in the main study children's

¹⁷The Scottish Credit and Qualifications Framework (SCQF) regulates credits awarded in the Scottish education system. 30 credits equates to 300 hours of student effort and level 9 is ordinary degree level study.

and mental health nursing students were excluded. Although all students had completed a common programme in year 1, their studies subsequently varied according to nursing specialty. The number of students undertaking the adult programme is much larger than the other programmes (approximately 250 adult programme students, compared with around 25 and 40 in the children's and mental health programmes respectively). Accordingly, it was decided to limit the main study to adult programme nursing students.

3.3.2.3 Sampling

A range of sampling approaches was considered before the start of the study. In choosing a sampling method, the key consideration was the exploratory nature of the research and the lack of evidence relating to how nursing students manage learning in undergraduate research and EBP education. The need to develop understanding of the student experience, in as wide and in-depth a way as possible, was also considered.

Purposive sampling was initially considered, as this is a common approach in qualitative research (Richards & Morse, 2013). Since the study was concerned with difficulty in learning, purposive sampling could have been used to identify students with poorer overall attainment during years 1 and 2, as measured by the grades achieved in their academic work to date. However this approach was discounted, partly due to ethical concerns, but also because selecting such students may have led to recruitment problems, if students felt they had been chosen because of

weak academic performance. Choosing such students may also have led to bias in interpreting the data, given that there would have been an expectation of difficulty or poor understanding. Since these students had not previously studied research and EBP as a discrete topic, this approach would also have assumed that poor achievement in one area of the curriculum would mean underachievement in this area.

Other drawbacks with this approach related to the nature of the study.

Using only poorly performing students may have limited the scope of the data collected. Excluding average or highly performing students would have meant making an assumption that such students do not experience difficulty to the same degree. On the contrary, these students may experience significant difficulties, but might simply have more successful strategies for managing and overcoming them. An additional consideration was the aspect of the study looking at the transformative process in learning about research and EBP. Inclusion of a range of students, in terms of their academic ability, had potential to yield rich and varied data on the nature of transformation in learning.

In considering purposive sampling, it became clear that there were no specific groups or types of students, other than those indicated by the inclusion criteria, so casting the net wide, to recruit a range of students, was the best approach. Other options then considered were probability and convenience sampling. For the pilot interviews convenience sampling was used because the sampling strategy for the main study had not been determined. Convenience sampling has the advantage of being easy to

set up and administer, though in educational settings this approach is likely to attract more committed and conscientious students, who are representative of a particular group of the student body and perhaps those who are generally high or middle performers (Cohen et al., 2011).

Taking account of the poor response using convenience sampling for the pilot interviews, a simple random sampling method was chosen for the main study. Although probability sampling is not commonly used in qualitative research, qualitative researchers take a flexible approach to sampling, based on the needs and context of the study (Sarantakos, 2005). Random sampling was judged appropriate to use because of the exploratory nature of the research and the aim of recruiting a cross-section of the students, in terms of their backgrounds, previous academic performance, attitudes to research and EBP etc. As already noted, it was also difficult to identify any particular subset of the eligible students that could usefully be selected. Simple random sampling ensures that all participants in a defined study population have an equal chance of selection (Beaulieu, 2012) and choosing a sample in this way offered a realistic chance of recruiting a range of different students, who could help to uncover different perspectives and experiences of learning about research and EBP.

In common with other qualitative forms of inquiry, narrative research studies typically have relatively small sample sizes, but each participant generates a large volume of data (Holloway & Freshwater, 2007). The

target was to collect data from two interviews for each participant (on commencement of the module and after completion of the module). A minimum of 15 students was required to ensure that a range of learning experiences would be captured in the research. Recruiting more than 18-20 students was not desirable because the number of participants needed to be low enough to ensure that all data could be analysed in detail and to give a voice to all the participants.

3.3.2.4 Recruitment

Recruitment to the study was carried out in two stages, at the start of module delivery in January 2012 (semester 2, 2011/12) and then again, for the next module delivery, in November 2012 (semester 1, 2012/13). This enabled students from both campuses to be recruited, as the module was delivered on the smaller campus in the first period and on the main campus in the second. The process was the same during both recruitment periods.

Prior to the start of the module, information about students enrolling on the research and EBP module was obtained from the programme administrators and cross-checked with the VLE site for the module. An online random numbers table was used to select potential participants. Students were assigned numbers using an alphabetical listing. In the first instance 20 students were selected using the random numbers table and these students were sent personalised emails, explaining the nature of the study and asking them to consider participating. The participant

information sheet was attached (appendix 3). A reminder email was sent out one week later to all those who had not responded.

For the first cohort of students an additional 10 students were emailed, a week after the first email, because of relatively low responses from the first 20 students. Recruitment for the second cohort was much poorer and so an additional 40 students were emailed, 20 a week after the initial recruitment email and then 20 more two weeks later. Recruitment for the pilot study is summarised in table 3.2, for the main study in tables 3.3 and 3.4, and finally the total figures in table 3.5.

Pilot Study (Sep 2011)	n	% of available	% of attendees
Available students	308	100%	-
Invited to participate	308	100%	-
Agreed & interviewed	2	0.6%	100%
Returned for 2 nd interview	2	0.6%	100%

Table 3.2: Student recruitment for pilot study

Cohort 1 (Jan 2012)	n	% of available	% of attendees
Available students	51	100%	-
Invited to participate	30	58.8%	-
Agreed & interviewed	10	19.6%	100%
Return for 2 nd interview	8	15.7%	80%

Table 3.3: Student recruitment for main study Cohort 1

Cohort 2 (Nov 2012)	n	% of available	% of attendees
Available students	223	100%	-
Invited to participate	60	26.9%	-
Agreed & interviewed	5	2.2%	100%
Return for 2 nd interview	3	1.3%	60%

Table 3.4: Student recruitment for main study Cohort 2

TOTALS	n	% of available	% of attendees
Available students	582	100%	-
Invited to participate	398	68.4%	-
Agreed & interviewed	17	2.9%	100%
Return for 2 nd interview	13	2.2%	76.5%

Table 3.5: Total student recruitment for all studies

In the first cohort 12 students initially offered to take part, but two of these were subsequently not included, as one did not arrange a time and another was not able to arrange the interview because of family health issues. In the second cohort recruitment was disappointing, though the total overall target recruitment of 15 students was met.

3.3.3 Ethical considerations

3.3.3.1 Research governance

Research data in the UK is covered by the 1998 Data Protection Act, which ensures that data is acquired, stored and used in compliance with the standards set out by the UK Government (1998). Academic organisations help to ensure these standards are adhered to, by providing

guidance for researchers, such as those provided by the British Educational Research Association (Hammersley & Traianou, 2012) and university research ethics committees also help to ensure that research is carried out with integrity and protecting the rights of the participants.

This study was approved by the Education Department Ethics Committee at the University of Strathclyde (appendix 6), as this was the home institution at the start of the study. Reciprocal approval was then granted by the university where the research was being carried out (appendix 7). Formal approval to access undergraduate nursing students for research purposes was also required by the school of nursing involved and was granted (appendix 8) ¹⁸. This is a school requirement, to ensure students are only recruited to ethical and well-considered research studies. Subsequently ethical approval was also discussed with Durham University at the point of transfer of the doctoral study from the University of Strathclyde to Durham University. No ethical approval was required from Durham University. As the research did not involve any contact with patients and did not take place in a clinical setting, NHS consent was not required.

3.3.3.2 Informed consent

The principle of informed consent helps to protect participants in research by giving advance knowledge of what they are being asked to do as well as giving written notice of their rights, specifically the right to withdraw

¹⁸ All identifying information for people and the organisation where the research took place has been removed from appendices 6, 7 and 8).

before the end of a study and the right to withdraw their own data from a study (Crow, Wiles, Heath, & Charles, 2006). It also protects the researcher by making it clear to participants what the research is about, why someone is being asked to take part and what constitute the boundaries of the study.

The participants gave written consent just before the start of the first interview and this covered both interviews; the participant information sheet had already been sent out by email. Immediately before the initial interview was started the consent form and participant information sheet were reviewed and the students had the opportunity to ask questions. It was explained that the consent applied to both interviews, so no additional consent would be sought prior to the second interview. The students were also reminded that they were free to withdraw from the study, if they wished, including not participating in the second interview. Prior to giving consent, the students were advised that the interviews would be recorded, though this was included in the participant information sheet and the consent form.

3.3.3.3 Data security

Recordings of the interviews were stored in a secure and private area of the university servers. Additional copies were held on two USB drives, stored in a locked drawer on university property. The transcriptions of the recordings were anonymised and stored in a secure and private area of the university servers. A backup copy was held on a personal, password protected computer. In the UK, research data may be stored and used for

an unlimited period of time, as long as storage and use comply with legal requirements (UK Government, 1998).

3.3.3.4 Confidentiality and anonymity

Chase (2013) notes that confidentiality and anonymity can be a particular concern in narrative research because of the detailed and individualised data gathered and the way verbatim quotes and accounts may be included in subsequent publications or presentations. This means that any limits to confidentiality and anonymity needs to be recognised and addressed, particularly in interpreting and publishing the findings. The recordings themselves held very little identifying data. Participants' first names were mentioned occasionally and students usually referred to members of university staff or healthcare facilities without identifying them, though infrequently a name would be used. Participants also invariably referred to other undergraduate students in the programme anonymously. In the transcriptions all identifying data was anonymised and participants were allocated pseudonyms. No one is therefore identified in any reporting of the study, nor are organisations identified. However, some students might be recognisable because of the specific stories and examples they have provided. Where this is the case, students will be contacted to ask if they would agree to such detail being included in any future publications.

3.3.3.5 Payment and reward

Students received no payment for taking part in the study, though travel expenses were offered to students for attending the interviews. All the

students except one arranged the interviews to coincide with being on campus for classes or study, so did not want reimbursement for expenses.

There was no direct benefit to students for taking part in the research study. The students were all told that the results of the research would be used to inform changes in the future delivery of research and EBP education in the school and that the findings would be written up for the doctoral thesis, as well as for publication.

3.3.4 Data collection

3.3.4.1 Interview 1

Students who agreed to participate were contacted by email to arrange a convenient date and time for the first interview. Students from the satellite campus cohort were first interviewed in January 2012 and those from the main campus in November 2012. The consent form was discussed and signed immediately prior to the first interview. The interviews all took place in a meeting room in the school of nursing, at the campus where the student was based. All participants were met in the reception area and there was opportunity for introductions and a short general discussion before taking consent and starting the interview. All the interviews lasted approximately 30-65 minutes and were recorded using two digital voice recorders, to ensure that no data was lost because of equipment failure.

The unstructured interviews followed a similar pattern to the pilot interviews. They opened with an introduction and then orientation in which students were asked to confirm their year of study and nursing programme, followed by general questions about how they came to study nursing and why they chose nursing. These acted as an icebreaker, but also gave valuable background information. The interview progressed by following cues from the students and following up on comments and events in their narratives. A basic schedule was used in the interviews (appendix 4) to ensure that topics relevant to the research questions were covered, though no specific order was followed, in keeping with the unstructured, narrative approach (Mischler, 1986). All interviews covered:

- General feelings about research and EBP, including any experience of research before coming into nursing study
- Understandings of research and EBP, including how each links to being a nurse
- Prior experience of learning about research and EBP
- Experience of research and EBP during practice placements.
- Reasons for undertaking the module; thoughts and expectations about the module.

These broad topics were influenced by the literature review, threshold concepts theory and by the data generated in the pilot interviews. Similar to the pilot, the students spoke openly and gave detailed responses to all the question areas. At the end of the interview students were asked if there was anything they felt had not been covered, though most students did not have anything further to add. Following the interview, the students

were reminded that they would be invited for a second interview, once the module was completed.

3.3.4.2 Interview 2

After the end of the module the 15 students who had given interviews were contacted by email to ask them to return for a second interview.

Eleven of the original 15 attended the second interview and a summary of the second interview responses is shown in table 3.6. Including the pilot interviews, a total of 13 students were interviewed twice.

Two students from the satellite campus did not attend for the second interview. One of these had not completed the module and did not respond to either of two emails inviting him to be interviewed again. The other student had completed the module but was on placement and lived over 25 miles from the campus, so did not manage to come for a second interview. The two students from the main campus cohort who were not re-interviewed did not respond to either of the emails sent to them about the second interview.

Study group	Campus	Date of 2 nd contact	Attended 2 nd interview	Did not attend 2 nd interview
Pilot	Both	Nov 2011	2 (100%)	0
Cohort 1	Satellite	Apr 2012	8 (80%)	2 (20%)
Cohort 2	Main	Feb 2013	3 (60%)	2 (40%)
TOTAL	Both	N/A	13	4

Table 3.6: Summary of second interview attendance

The second interview took place after the end of the module at a time and date suitable to the students. The second interviews took place over several weeks, because the students went into a clinical placement immediately after finishing the module. This meant that they were based off campus, with some working shift patterns, so it was difficult for them to attend the second interview quickly and flexibility was needed in arranging these. This meant that some interviews took place before students had received the results of their assessment work for the research and EBP module and others after grades had been sent out.

These interviews also took place on both campuses of the university. Students were again met in reception and the interviews were held in quiet meeting rooms. No further written consent was required for the second interview, as the original consent form covered both interviews. Students were reminded about this before the interview was started.

These interviews also lasted 30-65 minutes and were recorded. At the beginning of the interview, a short review of the purpose of the interview was given and the opening question was a general one about how the module had gone, asking the student to talk about any aspects of the module they wanted to start with. This provided a springboard for exploring different aspects of learning. As in the first interview, a flexible schedule was used, to ensure specific aspects of learning were covered (appendix 5), but the students were encouraged to speak freely. Broadly categorised, areas covered were:

- Experiences of learning and teaching during the module, including perceptions of changes in understanding
- Approaches to studying and learning, including managing learning online.
- How the module assignment was approached, including choice of article to critique
- Feelings and attitudes towards research and EBP, including using either as nurses
- Aspects of the module that were difficult or challenging, including research terminology and discourse.

These areas were influenced by existing evidence and by the pilot interviews as well as the 15 first interviews in the main study. Research terminology and discourse were identified in the pilot as a particular issue. This has also been identified in the literature, notably by Ax and Kincade (2001), so was included as a specific area to be addressed in the second interview.

Following the interview students were thanked for taking part and advised that a summary of the results of the study would be provided. This was sent to the students by email.

3.3.5 Narrative analysis and interpretation

Analysis of qualitative interviews can be challenging because of the apparently unmanageable and large volume of text (Newell & Burnard,

2010). This is made more complex by the varied approaches to narrative analysis that were identified earlier in the chapter in section 3.2.3.

Undertaking a scoping thematic analysis of the pilot data showed not only that relevant and interesting themes emerged from a small set of interviews, but also helped to identify possible ways forward for analysis of the main set of data, specifically the possibility of combining thematic and dialogic approaches, based on Riessman (2008).

3.3.5.1 Pilot data

Following completion of all the interviews, the pilot interviews were compared to the main set. The topics, style and format of the pilot interviews was very similar to the others, so the pilot data was included along with the rest of the interviews for the analysis. This meant that there were 30 interviews to analyse, comprising:

- Seventeen first interviews, of which: two pilot; 10 satellite campus; five main campus
- Thirteen second interviews, of which: two pilot; eight satellite campus; three main campus.

An advantage of adding the pilot data to the main study data is the additional data, which may help to confirm findings or offer different perspectives and insights. Given that the pilot interviews were very similar in areas covered to the other interviews, it is also ethical to include these students' experiences - to give them a voice. The potential weakness is that the approach to sampling used in the pilot study was different to the

main study. Furthermore the two students included in the pilot study were from different cohorts of students, compared with the main study, and one of these students was a mental health student, whereas all students in the main study were in the adult programme. To address these issues the pilot students are clearly identified, as relevant, in the reporting of findings and in the subsequent interpretation and discussions.

3.3.5.2 Thematic analysis

Traditional thematic analysis in qualitative research consists of what Polit and Beck (2012) refer to as “looking for units of information with similar content, symbols or meanings... discovering commonalities across participants, but also seeking natural variation” (p562). Narrative thematic analysis is similar in that it focuses on what is said, the content, but different in that the themes are derived from the narratives, which remain intact, rather than from coding and categorising phrases or short excerpts of text (Riessman, 2008). Other defining features of thematic narrative analysis noted by Riessman (2008) are the use of a theoretical framework within which the analysis is located, as well as a case-centred approach, recognising individual perspectives and narrative contributions.

The first step in the process involved a review of all 17 first interviews to identify the narratives. A working definition of narrative in the study was any discrete event or experience about an aspect or aspects of research and EBP and the number of narratives in any single interview ranged from 10 to 21. A small set of initial codes was developed, by identifying issues,

experiences and attitudes based on the interview areas, the research questions and the underpinning theory. This was extended during the coding of the narratives, when additional topics emerged. In total, 51 codes were identified for the first interview. Narratives were matched with one or more codes, depending on the content and complexity of the narrative. The process was then repeated for the 13 second interviews. The first 51 codes were used and a further 52 identified, based on the different topics and focus of the second interviews, giving a total of 103 codes (appendix 9).

From the codes a set of “meaning groups” was derived. These grouped together similar codes, based on the theoretical framework and the research questions (appendix 9) and some codes were used in more than one meaning group. In total 15 meaning groups were identified representing the underlying messages coming through from the narratives. These groups were then analysed and five themes identified (appendix 9). The process of assigning codes to meaning groups to themes was helpful in unpicking the data and making sense of it within the context of the research questions. However, narrative analysis is above all concerned with the individual stories (Patterson, 2008) and the use of the process described risks applying a reductionist approach to complex, varied and detailed data. To avoid this and preserve the case-centred and individual nature of the narratives, each theme was further developed by going back and reviewing the individual narratives and using the students’ words to illustrate the different voices and perspectives within themes.

3.3.5.3 *Dialogic analysis*

Dialogic analysis is an approach to analysing narrative that focuses on the voice or voices in narratives and the effects of the story (Frank, 2010). The concept of dialogism comes from the work of Bakhtin (1981), who coined it initially in writing about literary novels, but then applied it to all forms of words. It can be complex and Boje (2007) identifies four kinds of dialogism, of which polyphonic dialogism, “the full-embodied voices expressing different logics and ideologies” (p348) is most congruent with Frank’s conception, with its emphasis on the multiple voices affecting and being affected by the narrative. Riessman (2008) defines dialogic analysis in a similar way, as being focused on the reasons for a narrative and why it is told in a particular way, including the influence of the other players, the time and other aspects of the context. Dialogic analysis, using Riessman’s characterisation of it as a guide, was used to complement the thematic analysis.

Dialogic analysis was able to add meaning to the analysis process, by bringing out contextual aspects of the narratives and taking account of how students narrated their stories, including what other voices were there. The dialogic analysis was threaded through the thematic analysis by studying aspects of the context, the way students expressed themselves and the voices in the narratives. This was done by examining the narratives that have been used to illustrate the themes from a dialogic perspective, not just the content.

As part of the dialogic approach, narratives were analysed using a series of prompt questions, a technique advocated by Frank (2010). These were:

- What are the other key voices in the narratives and how are these presented?
- How does the student use language to convey meaning?
- What is the influence of the research interview context?
- How does the expression of the narrative add meaning to the theme?

This was integrated with the thematic analysis and a final review undertaken, to help to ensure that the analysis process had resulted in an authentic and justifiable interpretation of the narratives.

3.4 Conclusion

This chapter addresses the whole process of designing the research study, in which theory, methodology and methods were applied, including the congruence between them. The study was designed based on the research questions and taking into account the three separate, but related strands of theory, methodology and methods. Threshold concepts, as the main theory underpinning the study, was used to inform the research questions, as well as forming part of the backdrop for the study itself. During the design phase, other theories were also identified to contribute to a theoretical framework that underpins particularly the interpretation of the data. The choice of a narrative research methodology was also rooted

in the research questions, but was considered in the context of the theories being used, notably threshold concepts. This process of selecting theory and methodology was iterative, involving consideration of alternatives and going back and forth between theory and methodology.

The choice of methods took a more linear route, following on from identifying the methodology. The sampling, data collection and data analysis methods represent the application of the methodology to the study. Using the principles of narrative research methodology to develop the study plan helped to ensure that all elements of the study were congruent with the methodology and also with one another.

Chapter 4: Findings¹⁹

Stories always pose that question: what kind of truth is being told? Stories never resolve that question; their work is to remind us that we have to live with complicated truths. (Frank, 2010, p. 10)

In the quote that opens this chapter Art Frank effectively captures the crux of what this chapter aims to do – to uncover the truths the students tell about their learning, through their narratives of practice-based and university education. These truths are contextualised by each student's prior experiences (educational and other) and their individual personalities and beliefs, as well as the setting of the interviews and potentially by the interview itself. The truths are complicated because of the context of the interview, the differences between students and, for at least some students, are full of contradictions and uncertainty. Narrative analysis embraces this multifaceted nature of truth and so in this chapter the themes identified reflect a situated interpretation of the data, reflecting the location and theoretical context of the research study.

Above all, the analysis reveals complexity and variability in different aspects of how these nursing students learned about research and EBP. In the first interview 17 students talked about their experiences and

¹⁹ In the narratives cited, student names have been changed to preserve anonymity, as have any hospitals, other healthcare settings and university staff names.

feelings about research and EBP to date. Most of this interview focused on EBP, because the students had mostly very little experience of research. It covered learning in both practice and university settings. Thirteen of the original students came along for a second interview and this interview also explored elements of practice and university learning, but most of the interview was focused on the introductory research and EBP module that the students had recently completed. In this online module the students were taught about research methods and critiquing skills. The assignment work was a critique of a nursing research paper and they had a choice of two, one qualitative and one quantitative. Students in the pilot and satellite campus cohorts chose from a qualitative paper about day surgery or a quantitative paper about intramuscular injection site selection. The main campus students had different papers to choose from²⁰; the quantitative one was about hand cleansing in a hospital cafeteria and the qualitative one was about young, first time fathers.

The interviews were unstructured and this enabled students to talk about a wide range of relevant (or sometimes not quite so relevant) issues, though for each interview a loose schedule was used, to ensure that key areas were covered (appendices 4 & 5). The first step in the analysis involved identifying narratives and these were parts of the global narrative (the whole interview) that addressed a particular event, experience, topic or issue. The number of narratives in each interview varied, reflecting partly the lengths of the interviews - from just over half an hour to just over one

²⁰ The papers for critiquing were changed for the academic year 2012/13 and the main campus students undertook the module in semester one of that year.

hour, averaging around 40 minutes - and partly the different conversation styles of the students. In interview 1 the number of narratives ranged from 10 to 19 and in interview 2 ranged from 11 to 21.

The findings chapter begins with profiles for each of the students interviewed. All the students told their stories of coming into nursing, how and why this happened and this forms the basis of these profiles. They also include a brief overview of each student's research and EBP learning narratives, to help to capture the essences of their individual learning experiences.

Following on from this are the five themes identified through the narrative analysis (appendix 9) and all themes relate to research and EBP education. Each theme includes elements of practice and university based learning and is based on both interviews. The themes draw heavily on the students' own words, to lend credibility to the themes and to "animate" them (Frank, 2010, p3). Mainly, a thematic narrative analysis has been undertaken, complemented by a dialogic analysis. As described in the chapter 3, this is used to illuminate or magnify each theme, supplementing thematic analysis with the contextual nuances, examples and details of individual students, to help enhance the credibility of the analysis. Aspects of the themes are linked and this is reflected in the order in which they are presented. The first theme of variability is more descriptive and provides a backdrop for the other themes, a context in which the other themes sit. The next three themes are concerned with sources of trouble, degrees of

transformation and becoming a nurse, in the context of research and EBP education. These draw out the detail of the narratives, using the theoretical framework of the study as a reference point. The final theme, academic and professional thresholds, uses the trouble and transformation themes in particular, to help to identify the thresholds the students encountered and then examines these thresholds within the narratives. Links between the themes are illustrated in figure 4.1

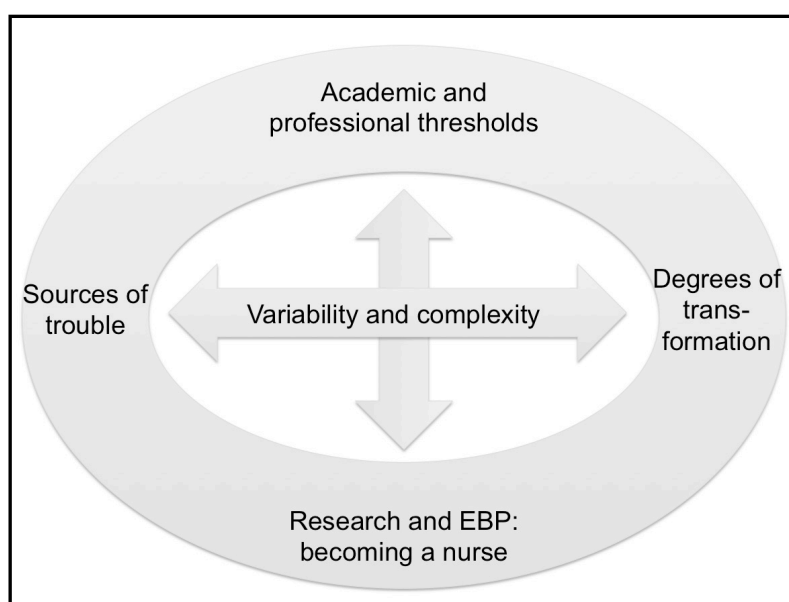


Figure 4.1: Themes

Despite some common facets, variability is an outstanding feature of the student narratives, when explored as a whole. This extends from the students' backgrounds to all aspects of their learning. In the first interview, students talked at length about placement experiences. The placements themselves were varied, as were students' reactions to their experiences. In the second interview the focus was on learning in the module and

accounts of all aspects of learning differed significantly. Someone coming new to these narratives might easily imagine that some students were studying different modules.

The study participants have been referred to as students throughout. This is because, throughout the narrative, this is how they identify themselves. It is also their identity in practice placements, as well as in the university setting.

4.1 Student profiles

Each student came to study nursing with different personal circumstances, education and work experiences, as well as a range of motives for deciding to study nursing. These sometimes influenced the students' learning experiences, so are useful to review, but more than anything they help to bring the learning narratives to life and give context to the interviews. The student profiles reveal a group that are quite typical of UK nursing students, as most of them have not come directly from school. In 2008 a survey by the Royal College of Nursing found that 65% of UK nursing students had been in employment before starting their nursing courses (Royal College of Nursing, 2008). Consequently the age range of the students varies from late teens to early forties. There were also other pressures on study for many of the students, as some students had children and others were working part-time. The most consistent element of the group was their strong positive motivation for studying nursing that was often linked to personal or family experiences of healthcare and a

desire to care for others. The profiles set the scene for the findings, by giving an overview of each student and, through this, an account of the group's characteristics.

4.1.1 Pilot study

Shannon

Shannon is a 20 year old student. From school, Shannon went initially to college with the intention of doing science-based courses, but once in college she transferred quickly into a nursing access course, which then secured her a place at university. Shannon's grandfather had worked in HE as an academic and she took guidance from him when writing her module assignment work, because he had experience of research. In both interviews Shannon's narratives are very positive about research and EBP and characterised by development and change in her understanding of research in particular, though at times she puts down her efforts to an extent.

Sam

Sam is a 26 year old student who had worked in care home settings with elderly people and then with people who had mental health issues. This led to his interest in mental health and becoming a mental health nurse (he is the only mental health nursing student in the group). To get into university he undertook a college course in psychology and that included some survey work. In Sam's narrative, he demonstrates a change in his attitude from the first interview to the second. He becomes much more

favourably disposed towards research and EBP, which surprises him, but which is also presented in a very positive light.

4.1.2 Main study: satellite campus students

Abby

Abby is 24 years old. After leaving school Abby qualified and worked as a nursery nurse for five years. She decided to give that up, as there were no career progression opportunities and moved into nursing, partly encouraged by some family members, who were already working as nurses. She had limited school qualifications but her childcare higher national certificate (HNC) gave her entry to the course. Abby gives the impression of being very thoughtful about her learning and placement experiences, in both interviews. She is generally positive, but also honest about the limitations of her learning and the reasons for these.

Caitlin

Caitlin is a 29 year old student, who had previously worked as a civil servant and did not like her job at all. She had always wanted to be a nurse and was very glad to have made the move to studying nursing. She did not need any further qualifications to be admitted to the course, but did an optional open learning unit in biology to ease herself into nursing study. Caitlin comes over as very industrious and a team player. She is motivated and very enthusiastic about EBP and in her second interview she shows a strong will to do research in the future.

Chrissie

Chrissie is 22 years old. She comes from a family of nurses and her mother had only qualified seven years previously. Chrissie talked quite a lot about her mother's positive influence on her. After leaving school, she worked for two years in a bank and then decided to take up a career in nursing. In Chrissie's single interview she expressed quite strong views on nursing identity, partly through her mother's eyes. She gives an impression of being positive about EBP, though less so about research.

Jess

At 20 years old, Jess is one of the students who went into nursing straight from school. She had wanted to become a nurse since having a small operation at the age of 12 and her decision was also influenced by having grandparents with dementia. She had never considered anything else and expressed no regrets about her choice. In Jess's first interview she is positive and quite confident about EBP. By the second interview her confidence is growing in both her EBP and research knowledge.

Louise

One of the older students who took part in the main study, Louise is 36 years old. As a child Louise had spent time in hospital as a patient and had developed admiration for nurses, which prompted her interest in becoming a nurse. However after leaving school she did a different university course, because of problems with her back and the high academic requirements at that time, to get into English nursing courses.

After having children, she was not enjoying her job, so decided to go into nursing and had no regrets. Louise's narratives through both interviews are interesting because they appear contradictory at times. She appears to understand research and EBP well and is very keen to do research, possibly as part of a Masters degree and alongside clinical work. However she is quite negative at times about EBP, at least partly due to the gaps between research, theory and practice.

Mandy

Mandy is 19 years old and has come straight from school to study nursing, but only decided to go into nursing about three months before starting the course. She had not considered nursing as a career, but was visiting relatives in Canada and witnessed poor practice towards a great-aunt in Canada who was dying. She felt she could do better and decided to look at nursing. When she came back to the UK she applied for January entry to nursing, which was available at that time. She was accepted and moved away from home to study, a decision she had no regrets about. Mandy presents herself as quite disorganised in her studies. She seems to have mixed feelings about research and EBP and is focused on clinical practice and becoming a nurse, more than study.

Ruth

Ruth left school in 2002 and is 25 years old at the time of the study. Initially she qualified and worked as a nursery nurse. She spent a year in Australia, but on her return she did not want to go back into nursery

nursing, so took a job as a traffic warden, working her way up to being a manager. She then decided to change career and thought about the two professions she had originally considered – teaching and nursing. She initially decided to go to college to do a nursing access course, but was accepted into university before completing that. Ruth is not engaged with EBP as a way of practising and she approaches the module as a stand-alone piece of work that is a vehicle for getting a degree. She engages with the module in a very organised way and clearly works hard but portrays this as being completely separate from other study or practice.

Sandy

Sandy is 35 years old. Some of Sandy's family members are nurses and he worked initially as a clinical support worker in the NHS, but left because of back problems. Subsequently he was made redundant from his job and decided to go back into healthcare and nursing specifically. Sandy gave only one interview. He comes across as very confident and committed to EBP and to research to a lesser extent. He is also at times quite questioning, even critical, of nursing and education.

Stuart

Stuart is a 40 year old student with an engineering background and in the past he had not seen nursing as something for men. However he was prompted to look at nursing as a career after helping to care for his wheelchair-bound father. He has no regrets and wished that he had gone into nursing years previously. Stuart seems to be very committed to

nursing and is quite serious-minded. He lacks confidence at times and is the only student who gave a second interview but had not managed to submit his assignment work. However he gave two detailed and insightful examples of EBP, in which he was the initiator of changing practice.

Sally

Sally is 24 years old and after leaving school she wanted to study forensic science but ended up working as a lab technician where she experienced research work being done. When the lab she worked in was going through a difficult phase because of economic issues, she decided to leave and study nursing. Sally was not sure if this has been the right decision because of concerns that the job market for nurses was quite poor at the time of the interviews. In Sally's first interview she is positive towards EBP, though feels it was sometimes absent from practice. In her second interview this positivity about EBP remains and she is also very positive about research, engaging in learning throughout the module.

4.1.3 Main study: main campus students

Sarah

Sarah is one of the older students at 40 years old. Sarah completed a zoology degree after leaving school and went straight on to PhD study. As early as part way through her PhD she realised that zoology was not for her and she wanted to go into healthcare. In the following years she combined work with bringing up her family and she had done a number of health related jobs, some of which involved research work. She then

decided to focus on qualifying as a nurse, to progress her healthcare career. Sarah's narratives changed from the first interview to the second. In the first she expresses a lack of confidence about her ability to understand healthcare research and is quite negative about EBP being implemented in healthcare. By the second interview she is much more positive about healthcare research, including her own understanding and also about the place of qualitative research. She talks at some length about her perceptions of her peers, whom she perceives as having very little interest in research or EBP.

Lisa

Lisa is 26 years old and, unusually among the group, she did not have any strong desire to do a particular job after leaving school, so had gone into administrative work, including doing an HNC. She also thought that she would not be able to study nursing, because of a lack of qualifications and ability. However, after looking into it, she realised it might be achievable and did some extra studies (including maths). Although she was not confident about being accepted to the course, she had achieved this. Lisa's lack of confidence at being accepted into nursing comes across in both interviews. She presents as thoughtful and able, but this is not her perception of herself. She is positive about EBP and also about research.

Kayleigh

Kayleigh is 37 years old at the time of the study. After having children, she had worked in care homes and retail settings. She decided she wanted to

get something more out of her career and thought that nursing might be for her. To do this she went back to care home work and had to do additional qualifications, before being accepted. Kayleigh is positive but quite tentative about EBP and research throughout both interviews. This seems to relate to both her self-confidence and the other pressures she feels that might make it difficult to be an evidence-based practitioner.

Liz

Liz is a 30 year old student, who had wanted to do nursing as a child, influenced by her grandmother, who was a nurse. However, after school she ended up working in Australia for several years where she had a good management career. When a friend in the UK told her that she was planning to do a nursing access course Liz decided to do this too. She left Australia, came home to complete the access course and then entered HE. Liz gave one interview and in it she is very positive about EBP. She expresses at length how she questioned practices and evidence when in placements. She feels less confident about the module, partly because she was told that she used insufficient research literature in assignments.

Fran

Fran is a student aged 31 and had worked as an engineer in the Royal Air Force for 10 years. She had left that career when she had her first child, because she no longer wanted to travel. She did a healthcare access course and wanted to study midwifery. She did not get a midwifery place, so decided to study nursing instead, intending to go on to midwifery after

finishing her nursing studies. However, having studied nursing she found it was not like her preconceived ideas and had decided that she would probably just stay with nursing. Fran has mixed feelings about EBP. She recognises its benefits for healthcare but has had mixed practice experiences. Fran also feels that other care-based activities take priority over time to find and read evidence. Fran is quite apprehensive about the module and does not feel that research is very relevant to her.

4.2 Variability and complexity in learning

This first theme provides a descriptive landscape of the students' learning environments and how they interacted with these. In the background chapter, the nature of UK undergraduate nursing education was described, including its structure and setting. This theme of variability and complexity in learning offers the students' perspectives of this educational environment, specifically in relation to learning about research and EBP. It is presented as two sub-themes, one of which focuses on the practice learning environment and largely relates to EBP. The other is about variability in the ways that students learn formally about research and EBP and this is principally about their learning during the module. Through these sub-themes, a detailed picture emerges of the varied and often complicated nature of research and EBP learning for nursing students. This relates to the messy, real life practice setting in which students have to learn. The delivery of healthcare is the main focus in this environment, not learning and added to this is the multifaceted nature of healthcare in terms of the specialties, professional roles etc. Complexity is also reflected

in the spectrum of approaches to studying and doing assessment work, made more intricate in this module because of its online delivery. The theme provides a backdrop for the remaining four themes by giving a framework within which to situate the challenges and change that typify them.

4.2.1 Variability in practice learning

This sub-theme is important because it informs understanding of the process of learning about research and EBP while in practice. It then helps to shed light on the theme that focuses on the troublesome nature of research and EBP learning (section 4.3) as well as the theme “Research and evidence-based practice in becoming a nurse” (section 4.5).

During the first interview the students talked about their encounters with research and EBP during the first two years of their nursing studies. The narratives about their practice placements were, without exception, detailed and full of examples of the wide range of EBP experiences that they had during these years. The influence of the practice experience on student learning came across strongly, particularly in relation to EBP, as well as the challenges posed by the model of half practice, half classroom learning, which was described in section 1.3. The unstructured nature of the interviews meant that the students were able to talk freely about the practice aspect of their learning. During the interviews the students were encouraged to do this and sometimes they strayed away from research and EBP, but this provided a rich breadth of narratives that included many

illuminating examples. In the narrative analysis any narratives not related to research and EBP were generally discounted, as they were not directly relevant to the research questions. However, they were part of the students' global narratives, so have been used at times to supplement the analysis, as appropriate. An example of this that was particularly striking came from Chrissie, who talked in some detail about her mother, who had qualified as a nurse only seven years previously. She talked about her mum's role working in an addiction team and her decision to return to a ward-based role, which was very interesting and appeared to have influenced Chrissie's own attitudes to nursing. This narrative was excluded, because it lacked any relation to research and EBP, but Chrissie's mother had also talked to her daughter about conceptualisations of what it means to be a nurse and a nursing student. This narrative was included in the analysis because of its indirect relevance to research and EBP as part of being a nurse.

The richness and diversity of narratives about practice learning (in relation to research and EBP) were present in every student's first interview and this is reflected in this sub-theme of variability in practice learning. There were more narratives relating to EBP than research, though the students had a range of research and EBP experiences, from very positive ones to others that were told in a neutral way, to others that had been difficult and negative. When looking at student narratives about EBP, there were many in which students talked about how different their experiences of EBP were from one placement to the next. This related to differences between

nurses in the wards and clinics and to the different departments in which students were placed. For example there were 20 learning narratives coded “variation in EBP in practice” and 15 coded “differences in EBP between healthcare specialties / depts.” There were fewer narratives about research in practice, though 10 of the 17 students were able to recall experiencing some type of research activity in practice.

4.2.1.1 Evidence-based practice in the practice setting

The students all presented detailed narratives of practice experiences in relation to EBP, though there was no particular pattern or common ground in terms of how they perceived that EBP was being used in different placements. Some students reported a strong evidence base for practice in most placements and others reported a lack of EBP in most placements. Of course, this partly relates to their individual understandings of what EBP is and students articulated their understanding of EBP in very different ways, from being quite simplistic, or even misguided, to being quite well developed. This issue is addressed in more detail in section 4.4.1, but the range of conceptualisations of EBP came across in direct questions about what EBP is and indirectly in the ways that students talked about EBP and its application in practice. These conceptualisations are important, but irrespective of this, students’ perceptions of how EBP is applied in practice situations are also crucial, because these may influence students’ attitudes to EBP and use of it, when they move into practice.

A common thread among all students was having some negative experiences of EBP in practice. Often this was linked to practising nurses' dismissive attitudes towards EBP. In the narrative extract below, Louise illustrates this vividly in her references to nurses "rolling the eyes" and "sighs".

But if you got, if you were on a busy ward and just didn't have time and they had the rolling the eyes and the sighs and everything else, then it'd be really easy to be swamped by that and to have that attitude... You don't see it [research] so much on the wards and research is always kind of eye rolling and if a new piece of research or different protocol or something comes onto the ward, it's always met with that kind of derision and big sighs and "here we go again".

Louise

Another common way in which students encountered this dismissive attitude was through nurses justifying their care by telling the student that they have always done it like that. Eight of the 17 students talked about this reaction from nurses they met on placements. In the extract below Lisa talks about practice that she and friends have witnessed, which they knew was not evidence-based. She recounts that her friend challenged this practice and received a response that defended the practice as acceptable, justifying it as longstanding custom and practice.

And a lot of the time when I ask nurses why are you doing that, they haven't said "it's because this says..." and even me and my friends were having a discussion today about Fragmin injections, how they should be given. They're not supposed to be given in the arm and we've read this in research somewhere. But yet the nurses in the hospital say "well it can be done because it's still sub-cut so it can be done". And they're, and my friend says she has taken up with this nurse, "well that's not right 'cos I've read it" and she's [the nurse] just said, "well that's how we do it here".

Lisa

In this case Lisa and her friends are correct that this drug should not be administered in the arm. However, even if the nurses had been correct, the reactions to Lisa and her friends were of concern from a learning perspective. The nurses involved seemed to avoid any discussion of the correct injection site for this drug and were potentially passing on poor practice to the students.

When talking about incidents like the one Lisa described, the students sometimes offered explanations for why practising nurses might be negative in their attitude to EBP or be unwilling to engage in EBP. Pressures of time were one recurring factor, with students referring to wards being very busy (as in Louise's example earlier in this section),

resulting in no opportunity at work to read and keep up to date. A second reason for nurses' lack of engagement with EBP related to their training; students suggested that because many of the nurses they were working with in practice had been trained using the traditional apprenticeship model, they would not have had a grounding in research or EBP.

A further perspective offered was that nurses may not know the basis for particular practices and the custom and practice justification of "we've always done it like that" reflects this. Students felt that sometimes when nurses told them to go and find out why something is done in a particular way, it was because they did not know about it themselves. This point is illustrated by Stuart, who is responding to a question about how much he was encouraged to look at research evidence in practice placements.

Like, I'm not going to say it's always a positive thing 'cos sometimes you get the impression it's "I don't know the answer" or "I don't want to answer". "I've not got the time, so could you go someplace else" and, but other places it is quite a positive thing.

Stuart

On a more positive note, all students were able to think of at least one placement where they could recognise EBP being used in a positive way. This was not always clear initially as six students' first reaction to being asked if they had seen EBP in placements was that they had not seen

any. In response to a question about evidence use in practice, Fran's immediate reaction is to deny that she had encountered this.

LM: Do people talk about evidence, or do you see the evidence being applied?

Fran: No, they don't speak about it.

However Fran went on to talk in general terms about how some placements were better than others and then recalled examples of placements where EBP and research were more overt.

Like in theatre there's always something different, something new all the time. Like there's always research going on about what's the best anaesthetic to use, or a five year old, is it the same as you could use on a ninety year old?

Fran

Fran then reflects further about her own responsibility for EBP in relation to the professionals she meets in practice.

...when I think about it now that you've asked me, is that he [the doctor] could be telling me anything and I'm going oh right, ok. He might have no clue of what he's just said

to me. I'm like ok. So that should make me go and you know, look for myself.

Fran

Fran's narrative not only recalls her practice experiences in relation to research and EBP, but also how she appears to develop and shift her way of thinking by retelling what happened in the interview. Most students did not openly reflect in this way, but as they talked they could identify at least one positive experience of EBP, even if at first they were quite negative about this.

All students were able to talk about specific placements where they had positive encounters with EBP. Some students had clearly been impressed by such experiences. They often involved individual nurses, who were knowledgeable about the evidence for their specialist area and were proactive in disseminating that to the student and, in some cases, to other nurses. In a few narratives students described nurses who encouraged others in their units to read journals and apply best practice, though this was not the norm. Abby talked about a placement in an acute unit for elderly people where her mentor had effected change through her approach to evidence and research.

But I had a really, really good mentor in first year on my second placement and she was really much, very much like research focused... She was always really for it and

she just said to us all, like everybody, she would bring in articles for everybody to read and at first she said she came up against so much resistance. They were just kind of left on the coffee table in the staff room where they collected dust and collected dust. She just kept adding to it and she just would stick them up on the walls and stuff and the more she got people involved, you know the people who were kind of resistant to the change, they began to see it. And she turned a ward that didn't have a great reputation into a really good ward.

Abby

What Abby described is a positive culture of EBP in a unit where EBP seems to be adopted as part of normal nursing practice. Other students described this type of positive experience of EBP and some experienced EBP very favourably because they were encouraged to engage actively in the EBP process. One student had even changed practice in one of his placements, prompted initially by a question he asked about practice. Stuart questioned reuse of filter needles (with the same patient) and when it transpired that no-one in the team knew if this was acceptable, they asked him to look at relevant literature about this and report back to the team. He could find no definitive evidence and it was discussed at a team meeting, where it was decided to change practice and use a filter needle only once, to make sure there could be no contamination. Some of the

language used by Stuart demonstrates the inclusive and active nature of this experience for him.

On my last placement I was community and like on a Friday we would sit round and things that I had wanted to look into, we'd discuss it back and forward and I found that useful... We actually, we actually stopped doing that [reusing the filter needles], because I had asked that question... it was really positive. It was like we're included in the team... and you were holding an equal voice sort of thing.

Stuart

The students described a wide variety of positive experiences and it was clear that all those interviewed could identify some aspects of EBP being used in healthcare. This was balanced by the many reports of an absence of EBP, either because it was simply not referred to or because it was more actively dismissed.

Thirteen students offered reasons for the contrasts in their practice placement EBP experiences. This related mainly to two factors: nurses and the type of placement. Other healthcare professionals and workers were mentioned at times, but to a much lesser extent. Students seemed to accept this variability as normal, though this did not necessarily mean that they were happy about it.

The students' experience of EBP in practice placements was very closely linked to the nurses they were working with. This ranged from nurses who never mentioned EBP to others who were clearly research-minded and strongly aware of the evidence base for their practice and specialty. This variation between the nurses is illustrated by Mandy.

And then, just out in practice I think it was just like, I think, most nurses if you ask them, they have a reason for it [their practice] and then you get your odd few who don't, just like "that's the way we've always done it". But I've always had really good mentors throughout and if I've asked "why do you do it that way", they always have a ... a really good reason for why, which I presume they get from research.

Mandy

In the extract from Mandy she talks about EBP in general terms and this was quite typical. Some students were able to give much more specific examples and these help to clarify the nature of the variations. The narrative below gives two examples from Caitlin and in these she contrasts her positive experiences of EBP with others in which EBP was absent.

I did a placement in the hospice in Riverside Hospital as well and they obviously... they have to be on top of their game for all their medications and things, but they also

have the information there. They have stacks of journals and they, you know, encourage you to go on to the intranet and have a look and if I ask something they would tell me and then she'd say to me "oh there's a journal article in whatever, go and have a wee read at it". So they were good in that they told me the answer, but then would go and push me to look myself.... My very very first placement was just a care of the elderly medical ward and maybe it's because we'd had nothing on it when I went there and I just wasn't aware it happened. In hindsight I don't think I saw anything.... I just never saw it at all.

Caitlin

Caitlin identifies some important elements related to EBP, including awareness of evidence from journals and the nurse asking her to go and find more information herself. In Mandy's example above, she seems to equate EBP with being able to explain why something is done the way it is. Although this is a necessary condition for EBP being applied, someone may, in good faith, give an incorrect explanation for practice. This way of describing a nurse who is evidence-based was found in other narratives, as was the reference to nurses basing practice on the way something has been done for a long time. Caitlin and Mandy's descriptions of variations between nursing staff, including the variability from one placement to another, were found in students from both campuses. In the narrative

below, Liz, based on the main campus, gives a very similar account as the one above given by Mandy, who was based at the satellite campus.

So you do question, “why do we do that?”. “Well because we do”... and depending on where you go, there’s always up to date journals and to give you something, I was just at the brain unit, they gave me a pack about brain injury and the best way that to treat them and stuff like that.

Liz

A slightly different perspective is presented by Sarah, who is older than most of the other students, has a PhD and has previously done a number of healthcare jobs. She challenges whether this variation is as stark as these examples have suggested, suggesting that EBP may be embedded into practice, but that this is not visible to students.

And sometimes when I ask questions I’m never, I’m never shown the evidence. I’m never shown “oh this is where you’d find...” I don’t think that’s happened once in the last two years. It doesn’t mean it’s not there and they’re not acting on it but I certainly don’t think that it’s something that’s obviously apparent or discussed on the wards.

Sarah

Although this point of view is a little more optimistic than the students who felt that some practices were based on historical norms rather than evidence, it is not any more helpful from a learning perspective, as the lack of explanation described by Sarah means that the student cannot know whether newly encountered practices are evidence-based or not. These examples illustrate the breadth of variation that students can encounter from the nurses they work with, ranging from no reference at all to EBP, to EBP being embedded as part of normal practice. They also demonstrate, to an extent, the different reactions students may have to what they encounter.

Students sometimes described variability in terms of the healthcare setting they were in. Thirteen of those interviewed talked about how use of EBP varied between different settings. Ruth gives a typical example comparing a specialist (stroke) ward with a general (admissions) ward.

...there's no policies used that I ever seen in admissions... I was in a stroke ward and obviously stroke is very like evidence-based and all... background of why, why you have to give certain medications straight after a stroke and I loved that, I really did love that ward... That admissions ward, they give me a list of tablets to go home and look up and try and see what they all done, but you don't get a chance, you're going home and you're

knackered and you're trying to fit in your part-time job and studies and everything else.

Ruth

Ruth's comparison of specialist units with generalist areas was characteristic of what other students reported, though quite a range of different areas were given as examples, reflecting the diversity of settings that students can be placed in. In the example from Caitlin earlier she was referring to EBP in a palliative care setting and other students talked about witnessing EBP in areas such as coronary care, a brain injury unit, and long-term care for younger people. Apart from admissions wards, the main setting mentioned, where the students felt that EBP was largely absent, was care homes for the elderly. This was explained by the students as being due to the low number of nurses working in such environments, where most care is provided by care assistants who have much less training and no requirement for formal healthcare education. The narratives were not uniform though and one student used a care home as a positive example of EBP in action. The two narrative extracts below illustrate this point.

And then I was in a nursing home and she was giving us, can't remember what it was, medication to this person and she said, "but you have to check, make sure that she's not got a low heart rate". Why would I do that? And then she said...

Fran

I was in a care home... And you can tell straight away that their attitude about certain things... I couldn't bear some of the things that I had seen.

Chrissie

This analysis of the narratives has shown that there were common experiences reported by students in terms of variability between the nurses they worked with and between different healthcare settings. The over-riding impression of the narratives is of variation in practice. The students encountered different levels of engagement with EBP across the whole range of placements they found themselves in. In narrating these experiences they appeared to accept this as part of the landscape of healthcare, though this did not necessarily mean that they felt this was acceptable. It appears that the variability in experiences of EBP in practice may be partially linked to the heterogeneous nature of the range of placements that each student is sent to. Although the students were not asked to specifically name every placement they had done, they all talked about different settings they had experienced and no students had the same set of experiences. Even students who had been to similar environments (such as nursing homes) had sometimes had very different experiences there.

The diversity in healthcare described by the students is not surprising and it gives a genuine representation of the environment and community they will practice in, once qualified.

However the diversity in their experiences of EBP is a potential source of trouble and in section 4.3 this variability will be explored as potentially being problematic for the students, whether they recognise it as such or not.

4.2.1.2 Research in the practice setting

The students' experiences of research activity during placements were also explored in the first interview. EBP and research experiences in practice were talked about separately, because EBP is something students should encounter routinely, given the emphasis in healthcare on using current and best evidence to support practice, whereas research is less usual and not an expected aspect of students' placement experience.

There were 10 students who reported having some experience of research in a practice placement and, of these, two had not witnessed research personally, but had talked in detail to nurses who had carried out research studies. The experiences were very mixed and the two students who had talked to nurse researchers, rather than witnessing research first hand, were the most positive about their experience. The opportunity to talk to someone who was a researcher was something these students seemed to find interesting and thought-provoking. Sally recalled referring to the research evidence that a heart failure nurse gave her to read.

It was quite interesting just to see that. Again it got you thinking, kind of thing... she was asking me questions

about what I thought and you know you're trying not to generalise and be impartial... But it was quite interesting.

Sally

Sally's quote indicates that she engaged in some discussion about the results and was prompted to give an active response. Further on in her narrative she emphasises how this experience made her think in a different way about the people she is nursing. This positive experience contrasts quite markedly with some of the experiences of students who saw research being carried out in placement settings. The eight students who had such an experience often reported them with a lack of detail and with a degree of uncertainty over what the research had been about and who had been involved. Six of these eight students recalled that they had been aware of a research study going on during a placement and two of them referred to two separate studies. Although they were usually not very sure about the methods being used, the students had noticed, or had been told about the topic being researched and sometimes referred to particular aspects of studies they had been aware of.

...and asking patients if they want to participate in it, em it's quite interesting to see all the decisions and all the consent forms and all the legal and ethical considerations that go into it. Because it's, the research that I saw was chemotherapy related. It was quite interesting to see, you know, what patients thought of it. And you know if there

was an alternative treatment to what was being offered, you know, I think that gave patients a bit of hope, a little bit of, you know, choice as well.

Shannon

Shannon was able to recall the consent process, including understanding that this related to both legal and ethical issues. She also recognises the potential for improving patient care and outcomes through research. Some of the students were less sure about what they had seen. Jess described a research study that was probably in fact a quality improvement initiative, perhaps resulting from previous research.

I'm sure I've seen one, but I'm trying to think where I seen it. [pause] Oh there was one, em, I don't know if it's kind of really research but obviously they have the medicine trolleys that you take round the ward, but they had some sort of evidence that it would be easier for them to keep it in their cabinets at the side of their beds, so they were kind of trialling that out.

Jess

Jess's rather tentative explanation – "...em, I don't know if it's kind of..." and "kind of trialling" – demonstrates the lack of certainty she has over what she is describing. This was echoed by other students, who used similarly hesitant language when talking about the studies they had seen.

Two students had been involved in research studies. One of these was a study about relaxation techniques for palliative care patients and the staff had been involved in the relaxation in a role that Caitlin described as “suppose her control group”. What was noticeable about this was Caitlin’s uncertainty. She was generally quite confident, articulate and positive through both her interviews. This event is unusual in that Caitlin is quite unsure of herself. Sandy was also involved in a research study and describes being asked to consent for this. The study was observational and was about cross contamination. He appears to perfectly describe the Hawthorne effect, as shown in the extract below and he also gave an account of the stress felt by being observed and feeling that he had to continually remember correct procedures.

It was more like an observation but we had to sign something to say that we were happy to be followed, so we were aware we were there and it did make you aware, thinking you were doing something, so you were always in the back of your mind, right I’m doing this, wash your hands. I’m doing this right, I have to do this and you were trying to remember to do everything in certain orders.

Sandy

Neither of these students, who were involved in studies, appeared to have a very clear concept of what the studies were about or what the nature of their involvement was. Of course all these reports need to be tempered by

bearing in mind that the students and their mentors had no requirement to take any interest in research studies and they may have taken place quite some time before the interview, so recall would not be particularly clear. The students also had no prior warning about this question and they may have given more detailed or specific accounts, if they had been able to think about this in advance. However, in terms of learning about research, there seems to have been a missed learning opportunity for the eight students who appeared to have witnessed research going on in placements. These experiences could have been a way of demonstrating the applied nature of nursing research and the ways that research in healthcare can influence patient care.

There was a substantial degree of difference between what students found in practice comparing research to EBP, with relatively little exposure to research. What research and EBP had in common though, was wide variation in the experiences that the students had, both positive and negative. In the next section, variability and complexity in university-based learning about research and EBP is explored. The university learning environment is more uniform, but there is variability associated with students' approaches to learning and also a degree of complexity in how they manage their learning.

4.2.2 Variability and complexity in university-based learning

In the first interview students had recently started studying the module, so the narratives about university learning were mostly current and forward

looking, centred mainly on practical considerations about the module, such as time management and working online. These issues also featured in the second interview, though in a more reflective way, given that all students had completed the module. Some had not received their grades at the time of the second interview and one had not managed to submit his essay. In the second interview the narratives described a wide range of experiences, attitudes and perspectives associated with learning, teaching and assessment.

Although this was the first time that students had undertaken a complete module online, they were already familiar with the VLE, having used it to an extent during other modules. There was a mixture of opinion about studying online, with some students preferring this and others who did not like it. Whatever the students' feelings, the online approach generally did not appear to have been a barrier to learning. This is illustrated in the narrative below, in which Kayleigh is quite well disposed towards online learning, but qualified this with some less positive language, such as "it was ok", and expressing a desire for a lecture.

There was a lot on it. It was really quite helpful. It was ok to sort of do the learning units. I suppose at times maybe it would have been nice to sort of get a lecture on things, but you know, obviously, it was sort of the self-directed sort of study, but it was good. It was ok.

Kayleigh

This desire for lecture contact was stated by a number of the students, though it was noticeable that they generally wanted just one or two face-to-face sessions and not regular contact. Most students did not have very strong feelings for or against the online delivery, but there were noticeable exceptions. Sarah was very happy with online learning and would have preferred to have had all modules delivered online, reflecting her dissatisfaction with face-to-face teaching, including group work. However Sarah also has a PhD and the independent learning demands of the online module were not problematic for her. Stuart contrasted with this, as he had not managed time and study well, failing to submit his assignment work. He attributed this to his own inability to manage online learning, and this was a recurring comment throughout his narrative.

I felt it was the online nature of it that got to me. Didn't seem to have the same support you do in, as a group, when you're actually coming in and doing the, the stuff, tend to knock ideas back and forward. I know there's the discussion boards and that, but they weren't really used and I just didn't.

Stuart

In this extract Stuart refers to not using the discussion boards and in the module these are the main formal means of collaboration among students and teaching staff. Ten students talked about the discussion boards in their narratives, of which five felt they were valuable and five had either

not used them at all or very little. However, for almost all those who felt the discussion boards had a value, this did not equate to using them frequently or consistently. Both Louise and Sam talked about using them in the earlier stages but then much less as the module progressed and only Shannon was unreservedly enthusiastic about using them.

The variable use of discussion boards needs to be considered in the context of the wider narratives about how the students learned during the module. The students talked about how they accessed support from their personal tutors and the module lead. Narratives about peer and informal support were also common and these included support from other students doing the module as well as family, friends and previous students. These alternative support networks are explored below, but an additional influence on use of discussion boards may relate to previous experience. Although these students had discussion boards available to them in previous modules, they were used as a supplement to face-to-face contact, so there was no history of using discussion boards as a key means of collaborating and communicating.

Many of the students used peer support to help with learning. For the most part, this took the form of other students taking the module, but some mentioned talking to previous students or other friends. For example Louise had a friend who was studying for a PhD, so she talked to him about her studies. Other sources of informal support were also mentioned. Shannon's grandfather was a retired university professor, so he gave her

some guidance about her assignment and Louise's husband read her assignment work. Students referred to different arrangements for support, including meeting up face-to-face either regularly or just as needed, communicating by text or phone and using social networking sites to discuss and help one another. Peer support for some was in the form of well-established groups who had already set up support networks and channels.

And those eight girls, we work together on a lot of things, so we're quite tight knit anyway... So we've had that informal support for a long time. And that's all we've relied on so we kind of see that as a formal support... We think along the same lines and we're comfortable enough that if one says "I think you're talking nonsense", the others are quite open to hearing, "what do you think", you know.

Caitlin

Caitlin's description of her peer group's strong lines of support is partly linked to their personal tutor being off sick, with no replacement given. In the wider narrative she emphasises the importance of peer support, but also acknowledges the danger of the group getting incorrect ideas. A different risk of group work, related to plagiarism, is mentioned by another student, who worked in a group of three. She describes how the group is for discussion and support, with writing done separately to avoid the possibility of plagiarism.

For others peer support was more about ad hoc discussions between friends.

...well just the friends that I'm close to on my course. I would speak to them just texting each other or speaking to each other about it and that helped I think... when you're listening or reading some people may pick up things up differently... they maybe have a different view or they heard different to you did, so it's good for that.

Lisa

Lisa's point, that her friends gave a different perspective and that this was helpful, is mentioned by other students as a benefit of peer support. However one of the students avoided talking to his peers about the assignment for this very reason. He felt that hearing other ideas might confuse him, though he was aware of other students discussing the assignment. This was an approach he described as a "rule" for all work. Only one other student talked about avoiding contact with other students and for her there seemed to be a strongly competitive and defensive element to this decision.

I just work away on my own. I don't, I don't even, d'you know, if someone's really stuck, I've such a, I tend to help too much. That's my problem. We've like a Facebook discussion board for our actual January 2010 module and

I know sometimes give away too much and at the same time I feel like I'm fighting over a job at the end of this too, like why should I help anyone else? They got themselves into this and part of me feels like you know, would they help me if I was stuck? So I have, I've such a weakness but then that's just being a nurse, I'm a caring person, I don't like seeing anyone stuck. But I have, I've tried now to step back a wee bit and just let people do it themselves... I've always been like that. I've never let anyone read my essays...

Ruth

Ruth's narrative is very interesting partly because it contrasts quite significantly with other students' narratives on this topic. Further into the narrative she describes how she had an essay stolen at school, so this may underpin her attitude and fears. She also presents quite a contradictory narrative in her assertion of being a "caring person" set against the comments "why should I help anyone else?" and "never let anyone read my essays". She associates her nursing identity with a personal characteristic of being caring, but does not appear to see any contradiction with the defensive and almost aggressive way that she refers to her peers.

Peer support seems to be important for many of the students and they mostly appeared to have ready access to such networks among fellow

students and sometimes others. However the nature of the support was quite complex in terms of how it was set up, what means of communication were used and what students shared.

Apart from peer support, the students had some access to formal support from their personal tutors and the module lead. There was no regular lecture or small group work and support from personal tutors appeared to be variable. Some students were offered teaching sessions; for example Sam had access to “two extra classes”. Others had very little teaching input. This variability was probably due to the diverse approaches of personal tutors, as well as the different cohorts that these students belonged to. The two pilot students came from different campuses and the main study cohorts, in the following academic year, were also from different campuses. Some students found lack of contact problematic and were left feeling quite isolated and disorientated in their learning.

I wasn't prepared for organising my time myself. I just, I didn't know how to go about setting it. I didn't feel under pressure to complete anything at any time. I just... ended up in a complete mess.

Stuart

Elsewhere in this narrative Stuart describes the usual approach of face-to-face classes as giving structure and form to modules, something he missed in the research and EBP module. For him formal classes appear to offer not just direct teaching support, but a way of organising and managing his learning.

Some students were able to access one-to-one or small group support from the personal tutor, whereas others had none.

... we had one meeting with Molly and she offered you know to meet again if you wanted to. But that really really helped me, meeting with her and she went through the whole lot and answered any questions...

Lisa

This contrasted with some students whose personal tutor did not engage. Two students referred to sending their personal tutor draft work but receiving very little feedback. This difference in support from personal tutors may have happened because the personal tutors are not used to teaching research and EBP, so some may have felt uncomfortable supporting their students. Indeed one personal tutor referred a student on to the module lead, to answer a query. All the students who mentioned the module lead were positive about her support. This came through email, discussion board support and face-to-face sessions. However these were mostly not pre-arranged and across most of the narratives the students indicated that they would have liked more regular face-to-face contact.

The students generally equated teaching support with face-to-face contact, though they did talk about other ways of getting help from tutors. This is probably because of past experience and for some students the lack of formal support was a significant issue. For others though, this was less

important and they did not feel it had impacted on their learning. The students also talked about how they used the content provided on the module site to learn. The resources were released weekly to the students for six weeks. Most of the students who referred to this were happy with the approach and some used this to help them pace their learning.

I don't like to leave it all to the last minute so I quite enjoyed it and I did make sure that I did read all the things that were available on Blackboard, so I wasn't just going straight into the essay without any background. So I do make time to read everything first.

Lisa

Only one student said that she did not like the weekly release, so a friend, who had already completed the module the previous year, gave her printed versions of the module materials. This enabled her to work ahead. Some students referred to printing out the materials and Shannon even brought her large folders with the printed content to the interview. Some students reported that they did not find it easy to read from a computer screen and others referred to having the materials to hand to refer to and make notes on.

Recommended textbooks and journal articles supplemented the module materials. Use of these was quite mixed, as some students used mainly journal articles and others accessed textbooks frequently. What was clear

from all the students in the second interview was that they made use of other resources, apart from those on the VLE. Generally the students indicated that all the module resources were of a good standard and this included students who had found the module particularly difficult.

When it came to the assignment work the students were juggling the critique for this module with an exam and some referred to having to balance the two. In terms of their attitudes and feelings towards the assignment, the narrative demonstrated much less variation than other aspects of their learning. This was the first time the students had been required to do a 4500 word essay and some expressed anxiety and concern about this, particularly in the first interview.

I'm a bit worried about the wordage because it seems to be quite a lot. But I suppose if you've got the 10 questions, you've got something to base all that on. It's maybe not too bad but I kind of struggle with 3000 [word] pieces of work. Find that quite a lot. But hopefully I'll have enough to write about. Yeah. But yeah it does seem quite a massive piece of work.

Kayleigh

Kayleigh's concern in the first interview is typical of students who talked about this and this needs to be set in the context of the students having no prior experience of this length of assignment. In this extract Kayleigh also

refers to having the “10 questions” and these were provided as a framework to help students focus their critique on specific aspects of the article and to guide them in the structure and content of the critique. In the second interview 11 of the 13 students talked about the value of the guiding questions and they were invariably positive about these, though one student felt that they were useful alongside other published critique frameworks. Stuart’s comment below is typical.

Stuart: I’d sort of read through everything I had and highlighted things and sort of put them into an order where I could. I’d broken it down into the 10 steps so I broke the, my journal articles down into segments to go with the, each of the 10 steps and then just put in a blank sheet at the front of each section with any book that I sort of wanted, just page number and that. Just roughly what it was about. That was pretty much me

LM: and was that helpful to get the questions?

Stuart: I think without them I’d have been totally lost. I wouldn’t have had much of an idea what they were actually looking for.

These questions appeared to relieve students’ anxiety about the assignment work, though they were instructed that the critique had to be written as an academic essay and not as question and answer. Two

students felt that the questions made the assignment very straightforward and Louise referred to the questions as “it felt like it was handed to us on a plate”. This student also said that if she had just been given the paper and been asked to critique it, she would not have known how to approach this. The guiding questions appear to have been pivotal for most of the students in making the assignment more manageable and reducing their concerns about the module and assignment work.

The final aspect to consider, about the students’ learning in the module, centres on how they planned and managed their learning. Some students seemed to be highly organised. In the first interview some had clear plans of how they intended to learn and in the second some described working week by week, following the VLE units, doing activities and reading, as well as working on the assignment. The plans described in the first interview did not always materialise though. Sarah described in the first interview how she planned to complete the assignment work before Christmas, to fit in with other study.

I want to try and do the module over the next three or four weeks and write the essay before Christmas. And just get it done and push it out the way. Because we’ve got an exam after Christmas and then another essay due in and then our big research essay as well... I have got a gap at the moment. It’s really easy when you’ve got a gap to kind of muck around with it. I always say I’m going to get them

done and I don't. It would be really good to get it done and just out the way. And that's my aim.

Sarah

Sarah did not complete the essay before Christmas, but she was still able to adapt and finish it in time. Some students were less able to plan and manage learning. For example, Stuart acknowledged frequently in his second interview how he could not manage time well and Abby described doing the assignment work in around two weeks, acknowledging "I didn't start mines until far too late to be honest".

The narratives reflected the range of different life circumstances for the students. Five of the students talked about having children and managing family life alongside study. Some of the students were doing part-time jobs too and at least one of the students had both children and part-time work to manage. Two of the younger students were living quite far from their families, in university accommodation. One of these talked about finding this mostly enjoyable, but quite difficult at the time of the first interview, because of the pressures of her studies and the realisation that she would soon be qualified.

I was heartbroken to be back. And I've never ever been like that. Then I just kind of realised that it was because I was so overwhelmed, because it's 11 months and I'm [will be] a staff nurse and I'm doing a degree.

Mandy

Other students referred to balancing study and other responsibilities with time to relax. Although they were not asked directly about their lives outside study, a variety, and sometimes complexity, of circumstances came across in the interviews and some students seemed to be managing very busy and demanding lives. Although they referred to the impact this could have on the module work, they almost always presented this in quite a matter of fact way. They seemed much more concerned with how to balance the module, particularly the assignment work, with other parts of their studies.

Throughout this theme, variability and complexity have characterised all aspects of the students' learning about research and EBP. This is a state or condition that the students work under and it is a backdrop that influences the other four themes.

4.3 Diverse sources of trouble

In the narratives trouble emerged as a complicated and pervasive element in the students' learning. In the thesis the term "trouble" has been used in relation to Perkins' (1999) concept of troublesome knowledge, as discussed in section 3.1.3. Terms like difficulty, challenges and problems have been used mostly in general terms, not associated with a particular theory, though difficulty is also used frequently in the threshold concepts literature. Initially, the trouble identified in the narratives was treated synonymously with troublesome knowledge, but many of the troublesome elements in the narratives could not be described as troublesome

knowledge, as they were about other diverse aspects of learning and often not directly related to knowledge.

Of the 103 codes identified across both interviews, 35 contained elements of trouble²¹ and appendix 10 shows each of these codes and an example from the narratives of how trouble was linked to the code. When assigning the coded data to meaning groups, as described in section 3.3.5.2, there were five groups that contributed to the theme “Diverse sources of trouble”. These include anything that the student narratives indicated was troublesome, i.e. challenging, difficult or problematic. Sources of trouble were found in the range of student narratives about practice learning and university learning, as well as relating to both research and EBP. Trouble appeared to relate to three main aspects of learning: knowledge; the students’ beliefs and attitudes; and learning environments. These areas are explored in the remainder of section 4.3 and they have been defined as follows:

- *Troublesome knowledge* refers to trouble that is inherent to the subjects of research and EBP
- *Troublesome selves* relates to the students own set of beliefs, attitudes and perceptions of research and EBP (*se/ves* is used in a general sense here, to denote the individual, personal nature of the trouble)

²¹ These 35 codes are linked to the five meaning groups that make up the theme of diverse sources of trouble.

- *Troublesome environments* are elements of trouble that are external to the student but related to the places where they learn.

4.3.1 Troublesome knowledge

Discourse and terminology were the principle source of troublesome knowledge found in the study. Research discourse refers to the way that researchers communicate in both written and spoken word, including the use of research terminology. Terminology can be defined as “the system of terms belonging to any science or subject” (OED online, 2014b). They were repeatedly identified as a source of troublesome knowledge for the students and this was related more to research than EBP. Students were exposed to individual research terms and concepts during the module and in preparing the essay. They were also introduced to the discourse of research, by being asked to read and review academic journal articles. Although the students had read academic papers in previous modules, they had never been asked to critically appraise the research process in such papers, so this module required them to interact with research discourse in a quite different way. This was apparent in the numbers of students who talked about the challenges of research terminology in the second interview, with 10 of the 13 students recalling difficulties with this.

The students encountered research discourse in the research articles they were asked to critique, as well as in reading materials for the module. Particularly in the first interview, some students referred to an assumption

that published, peer reviewed work must be of a very high standard, written by experts.

I think the majority of them I just accept what they say and then I'm reading another journal, they'll say, I'll just accept that that's right. I think you just accept, 'cos you think "oh well they've had, I know they've had to go through their peer reviews and blah blah blah, so they must be right". So I think sometimes you do just accept.

Chrissie

Through the module the students were expected to challenge the research papers they were reading, particularly the paper they were critiquing for the assignment. Such a shift from assumptions of quality and certainty in published academic materials, to actively appraising the quality of the research evidence, including how it was presented and written about, was found to be potentially troublesome.

Generally, throughout the interviews, students used research language quite hesitantly. Although not apparent in the transcripts, research terms were sometimes mispronounced or used with pauses. The terms quantitative and qualitative were mainly used correctly, though there was often a degree of hesitation. The challenge of these terms is talked about by Mandy in the context of a narrative about the difficulty of research terms.

Mandy: I still don't really, like yeah, like rigour I still don't like. I kind of know what it is and all that stuff, but like rigour, like really why that word? Why not credible? You know what I mean? ...but it's [the module] definitely helped for that, 'cos I had to define, like I know what qualitative is now. Know what qualitative is.

LM: do you think you would have struggled with that before the module?

Mandy: oh yeah I wouldn't have had a clue. It would have been like qualitative, what? That's good quality. I knew what quantitative, like I knew that was numbers and qualitative was quality, but that was it, so it was definitely helpful.

Mandy's narrative is full of questions and this appears to reflect confusion, not just about what terms mean but about differences between terms. For a researcher, the difference between terms like rigour and credibility is clear, but to a student nurse like Mandy this is obscure. She refers elsewhere in this narrative to "buzzwords", suggesting that research language may be deliberately exclusive and inaccessible.

The students' research discourse often appeared to indicate a liminal state; there was awareness of the range of terms and concepts,

understanding shown of some and difficulties apparent with others.

Kayleigh's tutor remarked on this in the summative assignment feedback.

...but I think it was the rigour bit that I had. I think I was trying to get more into it and at the end of the comments she did say she wasn't sure about my understanding of rigour.

Kayleigh

The tentative use of discourse and specific terms was also apparent in the students' conceptions of research and EBP. Students found it difficult to articulate what each is, in the context of healthcare studies, as well as the difference between the two. A noticeable example of this was the use of research to mean searching for information, a key step of EBP. In the short extract below Ruth uses research in this way, though at other points in the interview she uses research in the context of generating new knowledge.

Even going online that's research, that's me looking it ...
I'm bringing in other papers and I'm meant to just go
research this one...

Ruth

The volume of terms and time were both suggested as possible reasons for the troublesome nature of the terminology. Mandy's quote above

indicates that there are terms she has not learned and some students talked about using glossaries to help develop understanding of terms. Glossaries were also regarded as a reference point if they forgot meanings, either during the module or in the future. This was presented as a strategy for managing the difficulty of the volume of terms and a positive one for the seven students who described this. When asked, the students usually felt that research terms or concepts were not particularly difficult in themselves, but were made difficult by the time constraint imposed by the 12 week module.

This led on to comparisons of research terminology and discourse with that of nursing. The students agreed that nursing is full of nursing-specific and medical terminology, but identified three main differences to research. Firstly they had been able to build up their nursing vocabulary over the course of their studies and secondly they reported being receptive to healthcare terminology because this relates directly to their chosen discipline. Lastly, they were used to hearing nursing language not just in the university setting, but in their placements too. Sarah captures some of this from her perspective of someone who has previously undertaken research.

... just the [research] terminology and how much of it is that people feel like they almost shouldn't be doing it, because there was an element of that... The terms that we use of the wards, I think they're things that you can

associate with body processes and people and, and they mean more because of that. Whereas the terms associated with research they're drier, drier, the whole thing is drier.

Sarah

In this extract Sarah refers to students' feelings that research is not something they should be studying. Some of the students interviewed echoed this, but others were enthusiastic and positive towards it, despite the challenges of the discourse. The students' comparisons of research and nursing terminology highlighted the strange or alien nature of research terms and concepts for these students.

Nine students identified specific terms they found problematic. Several students noted that they found rigour to be a difficult term and this was illustrated by both Mandy and Kayleigh in the quotes earlier in this section. It was not clear from any of the narratives what specific issues made rigour difficult, but students from both campus groups mentioned this term. The other terms that recurred as being difficult were statistical ones. These included "p" values, confidence intervals and significance. The use of "n" to denote number of subjects was also problematic for some students. These terms were mainly mentioned by the five students who critiqued the quantitative paper and some of the students who chose the qualitative paper did so in order to avoid statistics and numeric data. Sam talked plainly about this.

...and I, like the reason why I didn't choose the other one, it was all about, it was all the numbers – qual, quant, quantitative. All about the numbers and it was a lot more, yeah, like I say, I'm not very good with numbers, so it'd be a lot of breaking numbers down and look at the means and the mode and all that and that's just not particularly good for me.

Sam

Sam's narrative is typical and hints at another common concern with numbers, which Perkins (2007) refers to as a "you either get it or you don't" belief about learning (p32). In this way of thinking about learning students identify themselves either as someone who can understand a topic or concept or cannot (and never can). This makes statistical concepts potentially very troublesome for these students and also exemplifies the impact that perceptions may have on learning. This impact is discussed in more detail in the next section.

While some students found statistical discourse troublesome and consequently quantitative research too, others were not comfortable with qualitative research. This was more nuanced than the discomfort with quantitative and statistical writing. One student, Louise, indicated that qualitative research was not for her, just as Sam described not getting quantitative research above.

I looked at the qualitative, looked at the questions, thought I don't understand any of those... it was that, that it wasn't very clear-cut. I'm one of those people who's very black and very white. I like definites. I don't like necessarily to see, how to draw, to peruse around a subject. I like definites.

Louise

These facets of troublesome knowledge provide some insight into the specific challenges that students encounter when learning about research in particular. The narratives revealed many different and individual perspectives relating to troublesome research knowledge, with 15 of the 17 students expressing some dimension of troublesome research knowledge. These reflect the issues discussed above as well as more general experiences of difficulty and Abby provides examples of this. She referred to the troublesome nature of research knowledge in eight separate narratives (five times during her first interview and three in her second).

... 'cos there was words used and the research method that I'd chosen, there was words that I had no idea what they meant. So it was you know trying to find out all those bits before you could then critique an article.

But with this I didn't feel, I felt quite distanced from the work. I think because, it was somebody else's as well.

I would much prefer somebody to just encompass it all and tell me everything about it. I think that for me the area's just too big for me to try and learn about on my own... I don't know if it's a bit about confidence as well because I still, well I am still a student so I feel like I need to be taught a lot of stuff... But yeah, I do get really lost in the research world.

Abby

Abby's experiences are unique to her, but as perceptions and reflections on her learning, they are representative of other students' narratives. They also help to demonstrate the range and individual ways that students may experience and interpret research learning.

In the third extract from Abby part of the troublesome nature of research knowledge links to the scope of what she has to learn. She then links this in to her own status as a student and a desire for a teacher to take responsibility for her learning. This leads on to the focus of the next section in which the student's "self" is explored as a source of trouble.

4.3.2 Troublesome selves

Troublesome selves refers to any source of trouble that is internal to the individual student and in this context selves includes impact of attitudes, beliefs, past experience and perceptions of research and EBP; in other words any element of the student's individuality that might affect their research or EBP learning. In the data, the idea of troublesome selves comes from narratives in which students expressed negative or ambivalent beliefs, feelings and perceptions about research and EBP.

These were not usually identified by the students as being problematic for their learning, though some students did appear to recognise this, such as Abby in the third extract at the end of the last section (4.3.1). Interpretation of these attitudes leads to the conclusion that these have the potential to interfere with learning, because of the ways in which they may predispose students to thinking of research, or EBP to a lesser extent, as being problematic or even undesirable.

Students expressed a range of negative feelings towards research, both in passing, as part of a wider narrative, or as the focus of a narrative.

Narratives around EBP were much more positive from the perspective of the students, so this aspect of the analysis largely relates to research. For some students any negativity was quite mild and reflected apprehension or anxiety about the module; this type of feeling was common in the first interview when talking about embarking on the module, or in the second interview when describing their experiences of the module. Other negative attitudes were stronger, and words such as "overwhelming", "daunting",

“struggling”, “tedious” or “boring” were common. Some students described how these negative feelings and perceptions changed, with the actual experience of doing the module work being less onerous than they had expected. This did not always equate to negative feelings and attitudes disappearing or becoming positive. Even some of the students who were relatively positive in their attitude tempered this with expressions that reflected a degree of ambiguity.

...at the beginning, because it was like a big, like staring up a big mountain. I mean you couldn't really see the end and it was, it was difficult to begin with, to get into it and everything, again because it was so different to anything that's been, we've done before. But no, I found it really useful in hindsight. Wouldn't say I'd, like, do it again. Yeah it has, no, it has, it has been good and I might, think, does give you an interest in the research, that you would maybe want to do more research

Sally

Sally's use of a mountain image to reflect her apprehension at the start of the module resonated with other students' narratives. By the end she is much more positive, though with some reticence, shown by her use of terms like “maybe” and “I might, think...”.

Alongside general expressions of negativity, seven students identified specific concerns they had, which led them to have a negative attitude. Four of the students linked negative expressions about research to scepticism or questioning about the usefulness of research in nursing. This aspect of students' narratives may be viewed positively, in demonstrating enquiring and analytical minds. However, if someone is sceptical about the topic they are about to study, within a context of that topic being an integral part of the discipline of nursing, then this is likely to be a source of trouble. For Chrissie, this scepticism appears to be linked to a misunderstanding of the module's place in the nursing curriculum and the extract below forms part of a narrative in which she questions the value of a research module, though she appears to be more positive about EBP.

When I'm reading this I'm thinking, like, I can see why some of this relates but not all of it... And then when you read the module and they say things like this, this is a module that is a, [pause] a, that can be applied to any degree, I always think, well nursing's specialised, it should be a specialised degree module we're doing... that's just like saying anybody can do a nurse's job if you're giving us a module, especially a degree module, that can be applied to any degree.

Chrissie

The misunderstanding about the suitability of the module for a nursing programme is unique to Chrissie and the other three students who expressed scepticism had quite different reasons for this: researchers deliberately using research discourse to exclude and confuse others (Louise); researchers changing the research question or aim to fit their findings (Stuart); and qualitative research not being valued compared to scientific research (Sarah). Despite these different reasons, scepticism about research or the motives of researchers has the potential to adversely influence students' research learning.

Three students had a negative attitude towards the module itself, expressing a dislike for it. One of the students found the module "boring" and uninteresting, whereas another's dislike linked strongly to the assignment papers. The third student, Stuart, opened his interview with "I hated it..." in response to being asked how he found the module. It was probably surprising that more of the students did not express similar feelings, given the compulsory nature of the module for any student completing the degree programme. This may have been due to the interviews taking place within the university and being interviewed by a member of academic staff from the school. Stuart's dislike of the module was specifically about the online delivery, rather than the topic, though he also expressed cynicism towards research, as described in the last paragraph. Stuart recognised the potential for negative attitudes to be a source of trouble. In his narratives he repeatedly links his failure to submit the assignment to his feelings about different aspects of the module,

though other students who demonstrated negative attitudes to research did not usually link this to finding research difficult and challenging.

Other facets of troublesome attitudes related to the module not being relevant either to practice or to future studies. This feeling was certainly not a general opinion among the students, but four students identified lack of relevance as a concern. This contrasts with other aspects of the nursing curriculum, such as clinical skills, for which links to practice are usually very clear. Despite the overall message of lack of relevance in some students' narratives, there are significant differences between students. Ruth offered the most extreme view of the module's isolation from practice.

... you're never really going to use it again. When do you ever hear like a nurse critically analysing a guideline on the ward? They don't have time and I feel like to me, three months was long enough to learn a module that may never come up again in my life. Yeah, say it was anatomy I'd take more time and I would focus more on it, but to me it was long enough. As I say for something that might never appear again, 'cos we, like, you never get a guideline or anything in the ward that hasn't been analysed...

Ruth

Ruth's narrative expresses not just lack of relevance to practice, but also the very different attitude to other parts of the nursing curriculum. The trouble caused by this perception is evident in that Ruth appears to have a misunderstanding about the quality and reliability of guidelines and evidence used in practice. Policies, protocols and guidelines may not be based on evidence, though Ruth seems unaware of this. She also seems to dismiss the need for practising nurses to critically analyse evidence.

The troublesome selves discussed have focused on negativity in the narratives towards different aspects of research. Troublesome selves may also be linked to uncertainty and liminality and ten of the students talked about this. Uncertainty was related to not knowing how well they were doing and what level they had reached, contributing, in threshold concepts terms, to the experience of a liminal state. The uncertainty was often linked to their assessment work and a feeling that the grade they attained would help to show how well they were doing in developing research understanding.

I will be gutted if I fail, 'cos I put everything into it. And I can't say that about every essay I've ever done. I shouldn't be saying that... but this one, I'll be devastated if I fail it because I think I've done really well. I hope I have.

Caitlin

In this extract Caitlin says that she thinks she has performed well, but alongside that, also expresses some anxiety that she might have failed.

This might be interpreted as a sort of academic false modesty, but Caitlin returns to this later in the interview, expressing very similar sentiments. For this student the module was mainly a very positive experience, but the uncertainty over her results appears to cause her some trouble, even if temporarily. For other students the uncertainty seems to be more deep-rooted.

...but I didn't really take on board their points, 'cos I thought this is my plan. This is the way I'm going to make my essay go. And if it's wrong, it's wrong. At least at the end of the day I know it's all my work... And I didn't, I noticed that a few folk had asked questions and people would answer it but I didn't even refer to them, if I was stuck on that question, because that could have confused me even further, so I just thought, no, I'm just going to stick to my own work.

Sam

Sam's way of managing a liminal state was to try to avoid any further confusion that might have been caused by listening to other students' comments. This particular strategy of managing uncertainty and liminality was quite unusual and most students appeared to use some kind of peer support during the module, as part of their approach to managing liminality. Throughout the narratives, liminal states, presented as uncertainty, were quite common and reflected the student's individual journey through

threshold concepts, particularly those associated with learning about research.

4.3.3 Troublesome environments

The final source of trouble relates to the students' learning environments and, importantly, to the interplay between these. Nursing education's equal split between practice and university learning is well established and aims to provide students with academic learning to support their transition into professional practice. From the perspective of research and EBP education, these environments seem to be a source of trouble both individually and in the tensions and differences between them.

The students' home environment is the university setting. For the students interviewed this was represented by two quite different campuses.

Students who were studying on the main campus were located in a typical university setting, with a large community of students based in many different disciplines and with the range of university facilities around them. Students on the satellite campus were based in a relatively small building, used only by nursing students and staff. Whichever campus the students were based in, the narratives revealed a troublesome university environment related to both research and EBP, though with different reasons for each.

In the first interview all students talked about research and EBP education during the first two years of their university study. For some students it

was not easy to recall what the nature of that learning and teaching had been, but all 17 students talked about some aspects of research or EBP education and 14 of these talked about both research and EBP. Related to EBP, 13 students also talked about information skills teaching during the first interview.

The university learning environment appeared to be a source of trouble for students' learning about research, but less so for EBP. When discussing EBP in the curriculum, students generally talked about having had EBP referred to throughout the curriculum, by a range of teaching staff and in different modules. Quite often they used vocabulary that suggested negativity around EBP being presented as compulsory, including a lack of enjoyment of EBP, though they did not say that overtly. Examples of this vocabulary include phrases like "drummed into us from day one" (Shannon), "...a lot, a lot. They always say..." (Fran) and "It's constantly preached into us, yeah." (Ruth). Some students did not recognise so much EBP in their university teaching though, as here:

In first year they did kind of mention it but it wasn't particularly much in detail, more like a whistle-stop tour, in a nutshell kind of thing.

Sam

The students were all following the same curriculum, albeit with some variations between campuses. Sam is a mental health student, unlike the

others, but the first year curriculum was identical for all these students, so his different perception is unlikely to be related to the different programme he is studying. Some of the students appeared to link EBP to using evidence or literature specifically in relation to academic assignment work and Sandy refers to this:

Evidence has been... A lot of it has been a case of you have to read your, is it your gold star? I can't remember. Gold star journals, your quality one, not your Google or Wikipedia.

Sandy

Some of the students also referred to having done a literature review in second year, when asked about EBP in the curriculum and many of them talked in some detail about their use of information skills. Most of the students presented EBP as a core concept within the curriculum and it did not appear troublesome for them. However, their discussion of EBP tended to focus on the use of evidence from literature to either justify assignment work or to use in practice and only one of the students (Shannon) showed awareness of the research, clinical experience and patient needs triad of EBP. Most did not seem to be aware of the potential complexity of EBP and understanding of EBP appeared to be strongly associated with using reliable sources of evidence, as Sandy referred to in his quote above.

Although the students showed no significant evidence of trouble in their university learning about EBP, their narratives suggest that within the university environment EBP is being taught in a relatively simplistic way, that fails to convey to students the complex set of skills required to be an evidence-based practitioner. There also seems to be no suggestion that EBP is underpinned by at least a basic knowledge of research.

Students' narratives were more troublesome when they talked about research teaching prior to the module. Most students reported that there was no research teaching or very little and many felt that this would have been helpful to them, particularly in preparation for the module. This was mentioned in the first interviews and then sometimes again in the second. The two extracts below show this initial concern, then reiterated in the second interview, after the module.

I feel I would have wanted more, like even just like, even maybe like a lecture on it [research]. Not even each semester, but even like once a year something... mainly about the research, like different types and things...

Evidence-based practice we've had quite a lot on. It's just like the different types of research.

Jess

I think it [research] should have been done a lot sooner. I think it should maybe even be the end of first year, start of second year, to understand it more.

Jess

This perspective on research teaching links to some of the students' feelings about troublesome research knowledge, reviewed in section 4.3.1. The students linked feelings that the module or research knowledge were "overwhelming" or "a mountain" to a lack of previous exposure to research teaching. This may be further complicated for these students, because learning about research is tied into degree level study and only students who have opted to do the nursing degree programme undertake the module. This meant that some students appeared to expect the module to be difficult based on it being a degree module, with research learning linked to a higher level of learning.

One student raised a concern about the credibility and currency of university teaching staff. This concern about the university learning environment was unique to her, but could be trouble-making because of its potential to undermine students' trust and belief in this learning space. The concern centred on teachers not being active in clinical practice and the impact this could have on their ability to teach nursing students.

I think a lot of lecturers are not in touch with what's going on in the wards. They've been out of practice for so long,

they've got no idea as to what is actually going on, you know.

Louise

This is part of a narrative about EBP and Louise presents quite a negative view of EBP, which she feels does not relate to practice, because of the lack of currency of academic staff. Although none of the other students expressed this strength of feeling or detail about EBP, as taught in the university setting, her assertion that most academic staff are not in clinical practice is accurate and raises an important issue about how EBP can be taught credibly to nursing students.

The sources of trouble found in the HE setting were quite different to the practice environment. In practice settings trouble was linked primarily to EBP rather than research. In the first theme, variability in the practice setting was explored in detail and this is the basis of the troublesome nature of the practice environment. Variability was found in different aspects of practice settings, including among mentors, other nurses on the wards and different specialties and departments. This was characterised by varying attitudes to EBP, differing amounts of EBP witnessed in practice and different extents to which EBP was part of the culture of the practice environment. The students were relatively accepting of this variation, but such diversity is likely to be troublesome, because it may be confusing. It also presents mixed messages in an environment that is

already new and stressful for students and where they are expected to learn self-selectively but with insight.

The variability of practice encounters is compounded by bad practice experiences and this was also discussed in section 4.2. Some students reported a lack of EBP in practice placements and others reported bad practice. Students responded to this differently and although some expressed a wish for more EBP, the students also recognised the complexities of healthcare environments, acknowledging that factors like time, underpinning knowledge or specialist area might impact on the use of evidence in practice.

...there isn't time. There really isn't time... I mean I don't think it's realistic to expect that a lot of people are going to choose to find the literature and read it. It isn't going to happen.

Sarah

As with variability, students seem to accept bad practice experiences as quite normal and part of healthcare practice, so for many of them they are not perceived as affecting their learning adversely. However, any practice setting where EBP is not practised, not obvious or where incorrect evidence is used, is a potential source of trouble for students, because of the inconsistent messages given.

The potential trouble in environments appears to be compounded for these students by tensions between the university and practice settings. Louise's narrative of the lack of currency of university teachers points to an undesirable position where the academic learning environment presents EBP as an integral part of being a nurse, but which may lack credibility, whereas the practice environment demonstrates variable EBP, yet is a more real setting for students, given that it is where their future work will be based. The tension and trouble seem to arise from the different messages from the two environments, relating to the importance of evidence and research. As already noted, most students express an awareness of EBP being important from early on in their studies. However, they also describe a range of experiences that conflict with this message in some practice settings.

The tension with research is rather different because the students were not exposed to it as a topic in its own right until third year and they also reported very little exposure to research studies whilst in practice. Ten of the students were able to recall research being done while in a practice placement (though one of these was most likely audit or quality improvement), but there was either no student involvement or else it was peripheral. Some of the students directly expressed concern with a theory practice gap for research, related to what was being taught.

... the lecturers... tell us, this is like when you're doing this,
this applies to when you'll see this. So you look, yeah,

whereas this [the module] just seems to be theory doubled on theory doubled on theory.

Abby

These tensions between the two settings are likely to be troublesome because they result in the messages given in university teaching not being substantiated in practice.

This theme has explored the different sources of trouble found across the narratives. Research knowledge appears to be more troublesome than EBP knowledge, but in the learning environments the trouble may impact more on EBP, particularly because of the tensions and inconsistencies identified between the university and practice environments. These sources of trouble - knowledge, selves and environments - contribute significantly to the research and EBP learning thresholds found and will be put into that context in the final theme.

4.4 Degrees of academic and professional transformation

The second interview was focused in the students' learning experiences during the module and from these came a range of narratives in which students talked directly and indirectly about how their attitudes, knowledge and understanding had changed during their studies. These are at the heart of this theme – degrees of academic and professional transformation. Transformation was not addressed overtly in the first interview, but some students expressed their thoughts about research and EBP, when talking

about their experiences as nursing students during the first two years of study. Where relevant this theme draws on these elements of the first interview narratives, but is mainly based on the second interviews.

The narratives that emerged were highly individual and reflected a wide range of ways in which students' thinking – academic and professional – had been affected by being a nursing student and studying the module. The second interviews took place over a period of weeks following the end of the module. This meant that, by the time of the second interviews, some students had already gone back into practice and others had received the grades for the module's assignment. Factors like these appeared to further change students' thinking and served to underline the shifting and, at times, elusive nature of transformation and change.

This theme comes therefore with something of a caveat, be wary of certainties. The use of 'degrees' to qualify transformation aims to show the spectrum of change and transformation exhibited by the students. In this theme the changes have been discussed in three broad categories: little or no change; development and change; and transformation. These categories aim to help in making sense of the students' narratives around transformation and change. However there are many nuances and contradictions among these narratives and the categories are blurred at the edges. One aspect of a student's narrative may seem to reflect very minimal change in thinking whereas another may suggest significant transformation. That is to say, the categories are not intended to be ones

in which students fit but rather aim to be representative of ways in which the students appear to have experienced and then reacted to different aspects of learning.

There are clear differences between EBP and research in the narratives. This probably relates to the place of each in the curriculum, as discussed in the sources of trouble theme, described in section 4.3. This section is therefore subdivided, with EBP and research each analysed separately. The similarities between them are brought together at the end of the section and also help to inform the next theme about becoming a nurse.

4.4.1 Evidence-based practice

In the first interview the students' understanding of EBP and attitudes towards it were explored through their narratives of EBP learning in the university, but also, and primarily, in their practice narratives. The students all talked about EBP generally or about specific aspects of EBP such as information skills. Naturally there were different examples, feelings and perceptions of EBP, but the overarching narrative in this context was one of students being favourably disposed towards EBP, whilst recognising the challenges of implementing it in practice.

Being an evidence-based practitioner to me is part of being a professional and, eh, it's also underpinned in the NMC codes... but barriers I think are, if there's not really a culture promoting it in practice. If the leadership, the

leadership in the clinical area's not really promoting it as such...

Shannon

This example is quite typical and shows a fundamental acceptance of EBP but tempered by the constraints of practice. Shannon has mentioned the role of leadership in EBP and other students identified factors such as time or knowledge and understanding of EBP related to training or age.

Alongside this positive attitude to EBP, the students' understanding of its meaning and principles were often quite limited. While the students understood the core concept of using research evidence to support practice and also understood the importance of information skills, they did not, in the first interview, generally articulate awareness of variations in types of evidence, how to critique it or how it might be applied in practice. Many of them talked about the importance of using reliable and healthcare specific databases for finding evidence, but this recognition did not always translate into using these databases when searching for literature.

Without exception, the students had mixed experiences of EBP and this has already been discussed as part of the previous two themes. A general understanding of using research evidence to support practice was apparent through the students' descriptions of good use of EBP in practice and poor or no use of EBP. However, students sometimes confused using research evidence in practice with using theoretical or textbook knowledge.

There was also a tendency to equate practice guidelines with evidence and to assume that these were reliable. By far the most commonly cited guidelines were SIGN (Scottish Intercollegiate Guidelines Network) and NICE (National Institute for Health and Care Excellence). Students frequently referred to these being used in practice and while they are well-regarded sources, all the students who referred to them did so without questioning their suitability for practice. None of the students challenged the principle of EBP, probably reflecting their experiences of it in the curriculum, as well as its embedding within the NMC Code of Conduct (Nursing and Midwifery Council, 2008a). Therefore, the overarching starting position for EBP among the students is broadly positive, partly because it is presented as a given for nursing practice. This positive attitude is also moderated by less certainty about the implementation of EBP in practice, as well as a relatively basic understanding of the stages, principles and implications of EBP.

In the second interview some students expressed very little or no change in their narratives about EBP, with overt or implicit reference to a lack of change in feelings, perceptions and attitudes towards EBP. However this did not necessarily equate to a negative attitude. Some narratives that gave this sense of minimal or no change sat alongside positive narratives about EBP. In other words, the module had not had a significant impact, but these students were already well disposed towards EBP. In response to a question about changes in attitudes to EBP due to the module Ruth says:

No, no, I, no, as I say, I've always worked with evidence-based practice anyway.

Ruth

Louise implies one possible reason for minimal changes in attitudes, when expanding on an earlier statement that she did not think the module had developed her awareness of EBP.

...you would look at something and ask why they'd done it, but you wouldn't look into the how it [research] was carried out and the module was very much about how something was carried out... and you wouldn't necessarily be concerned about that in your practice... I certainly don't look at things differently to how I would.

Louise

For Louise the focus of the module, critiquing and looking at "how it was carried out", is not relevant to EBP. This view links to a conceptualisation of EBP as mainly being the use of research evidence to support practice and this perception was common among the students. Louise does not seem to accept critical appraisal of literature as a component of EBP. This narrative of EBP after the module reflects Louise's generally more negative attitude towards use of EBP in practice. For her EBP is "head

knowledge” and she suggests that there would need to be a “big attitude change” in hospital settings for EBP to be embedded.

Ruth and Louise appear to have quite different attitudes, Ruth’s largely positive and Louise’s quite negative, but these apparently different attitudes are more complex than initial appearances. In other narratives Ruth’s seemingly strong support for using EBP in fact links to a dogmatic personal belief about using guidelines in practice and she feels very strongly that the module has not changed her attitude, mainly because she feels that her attitude and stance do not need to change. On the other hand, Louise shows quite significant changes in other attitudes (such as towards research) following the module, despite her quite negative responses about EBP. This may relate to Louise’s negative attitude being strongly linked to the difficulties of using EBP in practice and her perception of an overly theoretical focus in academic learning, rather than a negative attitude to EBP per se.

Four of the 13 students, who gave a second interview, did not feel that the module was relevant to their practice. The concept of little or no change in attitudes to EBP relates only to these students, but the examples from Ruth and Louise show the complexity of this attitude or belief.

Understanding more about such students may help to clarify the complex nature of student learning.

Most students felt that the module had developed and changed their understanding of EBP and its relevance to practice. Nine of the 13 students interviewed for a second time talked about development in EBP understanding and / or how the module relates to practice. The development in understanding of EBP was articulated in different ways. At a basic level, most students said that they would be able to critique another research paper if one was presented to them. Some said they would feel uncomfortable critiquing a quantitative paper, if their assignment had been a critique of a qualitative paper and vice versa, though others felt they could manage either. At a more advanced level that showed awareness of the developing nature of her critiquing skills, Abby felt it would be beneficial to critique another paper and that a second assignment of this nature would have been useful. Not dissimilarly, some students talked about the changes in the way they were likely to read papers in the future.

I certainly feel that if I was to read another piece of research work, I would look at more than just what's printed on the paper... and I probably would be more willing to read more pieces of research, eh, throughout my career, just to update myself... Yeah, 'cos that that's the biggest thing I'm surprised at, I think. I'm maybe at the opposite end now. Instead of just reading the words my mind's probably always thinking about, you know, the sample size, how many participants came back and how

the funding was done, the ethics, and I probably think about all these different things at the same time and before, you know, I probably wouldn't even have read the paper properly itself to read information, because I'm critiquing it almost.

Sam

This abridged version of Sam's narrative, about how his critiquing skills have developed, shows understanding of the need to appraise the different components of the research process. His narrative is particularly noticeable, because he links his improved confidence and knowledge of critiquing to future practice, expressing a desire to use this skill.

Some students talked about how their choice of literature had changed because of the module, due to a raised awareness of the quality of evidence, not just taking what is written for granted.

Cos I would use anything before in essays. If it said what I needed it to say, I would just use it, regardless of how good it was or how bad it was. I would just use it, 'cos, if I'm honest, I wouldn't know the difference. I knew the difference between peer reviewed and non-peer reviewed but that was about as in depth as it went. So now I'm a lot more picky.

Caitlin

In this extract Caitlin compares her post-module understanding with how she managed research evidence before. Further on in the narrative she refers to some of her peers doing the same. Other students had completed, or almost completed, practice placements following the module and these students made links between their developing understanding and experiences in practice. One such example was given by Lisa who had seen a patient being given oral morphine regularly and routinely, something she thought was perhaps not evidence-based. In the narrative she reflects on how her developing understanding might help her to challenge this, if she witnessed it again.

I learned, ask more questions why. 'Cos what I was bothered about was why all these patients were on Oramorph every hour and they're just so sleepy. That wasn't really to me, that wasn't getting to their pain. It's making them sleepy and so, if I see it a lot, I'll maybe say, why? If I found evidence, I'll maybe say to the doctor, don't you think she's a bit maybe had too much? I would feel confident...

Lisa

Lisa's example illustrates the way that her learning has changed how she thinks about evidence and particularly using it in practice, although her language is quite tentative, using words such as "maybe" and "don't you think...". A tentative use of language and hesitancy were common features

in the students' narratives and appeared to be related to a change in thinking and understanding, but one that still needed to be consolidated, reinforced or built upon. Lisa's example demonstrates hesitancy in how she thinks she might use her new knowledge in a practice setting.

Other narratives revealed awareness of how EBP is based on research, including how research consequently informs nursing practice. This is presented as something not previously realised. It seems contradictory that the students reported having had teaching about EBP throughout their first two years of study, yet some at least were not conscious of how EBP is based on research. This was one of the ways in which understanding of EBP changed during the module.

I think it was more just understanding about how
healthcare research informs evidence-based practice. I
remember reading a lot and thinking, oh right I understand
it a bit better now.

Kayleigh

Kayleigh's comments illustrate this developing understanding of how research and EBP are linked to each other.

A further perspective on how the module developed EBP understanding relates to why critiquing is an important part of EBP. In the earlier discussion of no change in attitude towards EBP, Louise showed a lack of

understanding of the link between critiquing and EBP, but in narratives demonstrating development in understanding, such as the one below from Lisa, there was evidence of comprehension that critiquing is an important aspect of EBP.

Well at first I thought, I just thought, why are we doing this? It's just something that I didn't think I'd be interested in, but after I've done it I've realised, like I just said, that not all research is right. I've realised that and if I'm interested in something, which I am interested in this pain relief thing, how it works, I can go and look at these things myself and, and work out if I think that's right.

Lisa

Lisa's example demonstrates a move from questioning the usefulness of critiquing to realising that research can be flawed and then to recognising that the skill can be used to inform her own practice.

These changes in understanding of EBP may be seen as developments or change rather than a transformed way of thinking. This is based on the tentative nature of the change and because they are characterised by changes in understanding of an aspect of EBP rather than a changed way of thinking about nursing with respect to EBP. The tentative nature of the change is shown in part of what followed the extract from Kayleigh's narrative above.

Like I know you get a lot of these clinical, it's not so much qualitative research, it's more quantitative isn't it, sort of? The random controlled trials for drugs and stuff like that. I don't know an awful lot about it, you know what I mean, how much is actually getting done to inform practice. Not that clued up on it all.

Kayleigh

Kayleigh's developing understanding of how research and EBP are linked, is limited by her lack of understanding of types of research and how much evidence is being generated. She also expresses herself hesitantly, using a question and phrases such as 'sort of' and 'isn't it'. Lisa's extract above also shows that her developing understanding of critiquing skills is quite measured. Further on in her narrative she comments on using critiquing skills as a nurse only once she has settled down into her role, perhaps a year after qualification.

A changed way of thinking about EBP was related directly to current practice in some narratives. In the extract below the change from studying EBP in the module coalesces for the student with changes prompted by going into third year, to change the way she thinks about using evidence in practice.

...but since the module I probably would look back at research evidence and stuff now more than I would have

before because, just before like, well I wasn't, well I was first and second year before. You just kind of followed your mentor about, just did what she told you to do. And then when you're in third year, you're expected to do stuff by yourself as well, so you can't really. I would prefer to see some sort of evidence that what I was to do first before I went and did it. Especially that I'm more doing it off my own back.

Jess

Jess shows a shift in her approach that she links to both the module and becoming a third year student. The wish to use evidence to support practice came through in other narratives and is more than just doing what has been taught. It is linked to ensuring that patients are given the best possible care, both to fulfil professional responsibilities and to avoid doing something incorrectly.

The changes described represent an altered way of understanding to different extents and in various ways. For some, they show a change in the way of thinking about nursing practice and patient care. Looking at EBP, the changes seem to be on a continuum and none of the narratives demonstrated a fundamental transformation in students' understanding of EBP, but taken within the context of EBP being part of the curriculum throughout the programme, this gradual change makes sense, building on previous learning and experience.

4.4.2 Research

Unlike EBP, the students' conceptualisations and perceptions of research in the first interview were characterised by anxiety and apprehension. In their narratives they attributed this not just to the topic of research, but also to the module being at degree level and to the amount of time they were anticipating would be required. This was exacerbated to an extent by instructions on the module site implying that students would need to spend 50 hours each week on the module. Some students were also anxious because of the online delivery of the module, which was different to previous modules. Eight of the 17 students had previously had some exposure to research before coming into nursing, either in previous work settings or other studies and 10 reported some experience of research studies in practice placements. Apart from one student, this did not seem to affect the apprehension they felt about the module. The exception was Sarah who had a PhD in zoology. Although Sarah did not have the anxieties displayed by many of the other students, she expressed a lack of confidence in her research skills, based on the landscape of healthcare research, and nursing in particular, being very different to her scientific background.

Against this set of perceptions related to studying research, the students gave varying accounts of what, if any, research teaching they had been given during the first two years of their studies. Some said this was none at all and others reported they had been given some sessions about research. All agreed that they were coming to the module with very little

prior knowledge or teaching. Consequently it was not surprising that students' understanding of research terms and methods was generally quite limited, including in relation to EBP.

I think research is if you go in with a focus, like if you wanted to research, research, that's what you're doing... Research is like, I'm trying to get my words that kind of make sense. To me research is when you're actually like looking at things and reading up on things and doing trials and stuff to find out an answer whereas evidence-based practice is the practice that you already do, you've just got evidence to back it up... you use the research to practice, but research is not practice. I think, is that right?

Mandy

Mandy, like many of the others, struggles to put her understanding of research (and EBP) into words. Her narrative confuses the common usage of research with the meaning of research in the context of academic study, shown for example by putting "looking at things" alongside "doing trials". This is quite a common confusion in the narratives, mainly in the first interviews but at times in the second ones. Mandy becomes a little clearer towards the end of this piece but the ending with a question illustrates her uncertainty.

This absence of research knowledge and understanding contrasts markedly with the students' familiarity with EBP and this is subsequently

reflected in the different ways that students' understandings and attitudes to research change over the module, compared with EBP.

For a small number of students there was very little reported change in attitudes or thinking in relation to research. This was associated with different aspects of research understanding and attitudes. In part it linked to perceptions of the healthcare environment, rather than to the students themselves. In such narratives, studying research was viewed as irrelevant because of a perceived divide between research and nursing practice, although, even among these students, there was generally some aspect of research development as they went through the module.

For one student there appeared to be acquisition of knowledge of basic research concepts, but this was offset by a lack of any change in her attitude to research in relation to EBP or nursing. This student's case is of interest because she treats research as an isolated topic with no relevance to other aspects of study or practice. Initially, when looking at her approach to learning, she seems to be very organised in her approach to study and assignment work, something she takes pride in and that is a pattern for her studies. Despite this, her narratives about research suggest no connection to nursing practice and she views the module as a necessary component of her nursing degree, but one that has no use either currently or for the future.

Even going online that's research, that's me looking it up. Granted I might take well one or two times to find the official stuff, but I've always done that from day one. Even before I started my nursing, I've always went to research and I've always, if I'm not sure about anything, I'll go and look it up... I think that would be the main thing is, is the learning how to critique. Because that's something that we've never done before. But the actual research bit, as I say, it's something we take on board anyway. It's something that's been preached into us from day one. So the actual research module, all it showed me really is how to critique and that's how to go through each area and question.

Ruth

In her narrative Ruth reduces research to something functional and simplistic, including her misinterpretation that going online equates to research. She refers to learning about critiquing, but then comments that critiquing is "how to go through each area and question". These extracts are typical of other parts of Ruth's narrative. She conveys a sense that although she has acquired relevant knowledge to complete the assignment work, the more important steps of linking that knowledge to her practice and other studies are absent. In terms of thresholds, she has not entered a liminal state or crossed any thresholds because she does not acknowledge that these exist. Her narrative is unique and quite

extreme, compared to other students. It is also interesting because she nominally learned concepts of research and applied them to the assignment work, but this learning has failed to result in more developed understanding since she has failed to make connections with her wider studies or her practice.

Ruth's narratives are interesting because of their unique qualities and they also serve to highlight, by contrast, the majority of students who showed development and change in their attitudes and understanding of research.

Knowledge acquisition was evident in students' use of language and their discourse around research. In the previous section about the degrees of transformation in EBP (section 4.4.1), Sam's quite relaxed use of language, ("the sample size, how many participants came back and how the funding was done, the ethics") showed familiarity and confidence in referring to aspects of research. While research knowledge acquisition is positive and shows academic development, this alone is not sufficient for these students to making their learning meaningful. In this context meaningful learning also requires links to be made to nursing practice. Otherwise the acquisition of knowledge lacks any accompanying progression in understanding relating to other parts of the students' studies or to the practice setting. Stuart ended his interview with the following extract:

I want to keep moving forward. I want to learn new things
and I want... so research helps to move me forward,
keeps improving your practice.

Stuart

Despite the difficulties that Stuart encountered during the module, his attitude is very positive in terms of research being linked to improving nursing practice. Stuart's attitude to research differs significantly from Ruth's in the way he links research knowledge to future practice. This link between what was learned in the module and practice or future studies was typical for students who showed change.

Other students were tentative in their use of research terminology or discourse, using it in a provisional way, trying out an unfamiliar language. For some students this was shown by use of quite complex terms, which were used in the right context but not well understood. One student had interpreted the qualitative paper she was critiquing as a phenomenological study, even though this was not stated in the paper and contradicting her friends who thought it was a grounded theory study. However her recollection of phenomenology was that it focuses on "exploring people's sort of feelings... like their perceptions" (Kayleigh). This student is typical in starting to develop and use quite complicated research language but in a way that shows the early development in her understanding.

Five of the students referred to awareness of the limitations of their knowledge and the difficulty of research in their narratives. This came through in narratives about how much they felt able to use their new knowledge in practice.

But I don't feel like I got, after completing the essay, that I could do that quite confidently. D'you know I still didn't feel like... really quite knew. So yeah I do think that it's something that should be taken into practice but I don't feel that after that one assignment I could do it.

Abby

Others students referred to a new understanding of the complexities and difficulty of research, but in a positive way.

...it's huge, huge subject and to do it in one module's, you know, quite something. And I think if it had been two modules, you know, maybe one on quantitative, one on qualitative or something, because, it would have been good to have more of an understanding of the quantitative side of things.

Shannon

The narratives quoted in this discussion of development in understanding represent the changes, sometimes of a tentative nature, that came

through in the second interviews. These changes varied from one student to the next, in terms of both the degree of change and the nature of that change. For most though, their engagement with the module had impacted on their understanding of nursing research in both academic and professional terms. In some of the narratives a more significant degree of change was evident that may show a transformed way of thinking about the values of research for nursing practice. These narratives were different from the narratives of change and development because they appeared to show an ontological shift in the student's way of thinking.

In this group of students these new ways of viewing research in relation to nursing were manifested in three areas, and these are presented below, but what was also noticeable was that such shifts were always linked with a fundamental change in attitude, though knowledge and understanding could still be incomplete or wrong at times. In reviewing the global narratives of the students who completed both interviews, six of the 13 talked about transforming experiences. The nature of the transformation was affected by their original position, which is clear through a comparison of Sam and Sarah. Sam came to the module feeling apprehensive and that research is for "somebody who's very clever with numbers..." (Sam). He had very little prior experience of research. By the end of the module he is very positive about his knowledge and the usefulness of research for practice. Sarah already had a PhD, so came to the module with an advanced level of quantitative research knowledge but relatively little confidence and some scepticism about healthcare research. By the end of

the module her confidence is much stronger and she was surprised to find that she had integrated previously acquired knowledge to nursing research. She also had a changed understanding of the value of healthcare research and particularly qualitative methods.

Specifically, the ontological shifts for this group of students were evident in three areas: possibilities for becoming a researcher; awareness of the limitations of current understanding; and use of terminology and discourse. Each of these represents an ontological shift because they are characterised by a transformed way of thinking about research. In this the students took aspects of their research learning and integrated them with other areas of their academic and professional learning, to develop a more advanced understanding. The short extracts below exemplify each of these three transformations in turn.

I'd like to do both [research and clinical practice]. I'd like to do clinical practice as well... but I'd love to be sort of forward thinking and pioneering for something along those kind of lines, but I would still like to stay in clinical practice as well.

Louise

This short extract sits within a context of Louise's scepticism about research and its relevance to practice in the first interview and even in the second interview she questions the value of the module for EBP, because

of its theoretical focus (see section 4.4.1). In terms of research, she now views nursing research as a potential career, alongside clinical practice. Indeed, this extract is preceded by her talking about being disappointed that a research-based Masters degree in nursing that she has seen advertised was not open to her, because the closing date preceded the end of her degree studies.

In the second interview Caitlin expressed her desire to do research at different points, realising that she could realistically aspire to this. She also demonstrated a transformation around the difficulty of research.

It was better than I was expecting but more difficult than I was expecting. But in a good way more difficult. It was something to kind of get your teeth into difficult... Something I realised I knew less about than I thought. I thought it was all about random controlled trials and things like that, but there's a whole lot more behind it that you don't see before it even gets to that point... it wasn't above and over my head. It was difficult but I realise now, it's not taken me that long to learn all the stuff that the module was teaching us.

Caitlin

At the same time Caitlin appreciates both the complexity of research but also her own ability to manage that difficulty and learn. Caitlin's position

demonstrates a fundamental shift in understanding because of her integration of the realisation about the difficulty of research with her beliefs in her own ability to learn.

For some students, evidence of transformed thinking came in the way they used discourse and the language of research. Terminology and discourse have already been discussed as a source of trouble, but Shannon's narrative below demonstrates the way in which her altered use of research discourse points to a new way of understanding the topic.

It was Glaser and Strauss she'd used for her grounded theory. Now I was under the impression that grounded theory was quite popular at one point when I was looking through my books and things and it was not bad you know. I think it was quite a good, you know, approach to use, but I don't know if... When I was looking at it, I just kind of got the impression that she added in her own wee bits and didn't follow religiously with what grounded theory is.

Shannon

Shannon's use of language shows, on the surface, her ability to talk naturally about grounded theory, but on closer reading it also shows that she understands that methodologies have their own approaches and principles and that there are implications of not adhering to these.

These examples of transformed understanding are underpinned by narratives that express belief or confidence in the importance and relevance of research to nursing. Varying degrees of change in understanding characterised the narratives and these could, at times, be linked to the student's previous views and experiences. They were also characterised by the individualised nature of the changes that could vary significantly from one student to the next, partially based on past experiences both academic and professional.

4.5 Research and evidence-based practice in becoming a nurse

The theme of becoming a nurse in the context of research and EBP came across in both interviews and highlights an important aspect of nursing education (and other professional learning), i.e. that the students are all on the same journey towards becoming a professional. The stories that the students told about how they had come to study nursing mostly had in common a strong desire to be a nurse. This is subsequently evident in the way they talk about their future profession and how they situate their learning experiences within the ultimate goal of qualifying. One of the students talked about guidance from her mother, who is also a nurse:

She said, "you need to be proud to be a student nurse and then when you qualify you should be proud to be a nurse... You're not just an employee, you're part of

something... you have a profession, it's something that's worthwhile, it's not just a job".

Chrissie

This ideal was echoed by many of the students in their narratives of why they wanted to study nursing, motivated by "helping people for a change" (Stuart), "always been a caring person" (Ruth), "I'm meant to do this job" (Liz) and "thinking... I made a difference today" (Lisa).

In the previous two themes, issues around becoming a nurse were an indirect aspect of the discussion. In particular, one of the sources of trouble for students was troublesome selves. Research was found potentially to be a source of trouble, because it is not necessarily a subject or activity that students associate with what a nurse does. Becoming a nurse also links into change and transformation, though in a professional sense rather than focused on learning. Becoming a nurse was also identified as a theme in its own right and at its simplest this is because it is referred to directly and indirectly throughout the narratives, in relation to practice experiences of research and EBP, as well as when students talked about learning experiences. It is also plainly the reason these students had entered the programme. More specifically, it is a theme in its own right because EBP is accepted as a core principle of nursing practice and part of professional identity (Nursing and Midwifery Council, 2008a), yet the narratives revealed tensions and ambiguity around this issue. These tensions linked to the students themselves and their perceptions of

the nurses they worked with. The students also told quite a number of future narratives in which they talked about how they wanted to use research and EBP in practice, as well as what they thought their challenges might be. Within a context of research and EBP, the first part of this theme looks at the students' views of the nurses they have worked with in practice and the second part is based on the future narratives of moving into the nursing community.

4.5.1 Students' perceptions of nurses

Student nurses are in a unique position, as peripheral members of the community of nursing practice. They are at the edge, waiting to be fully admitted. In terms of their time in placement, this aligns them with nursing staff, but also sets them apart and the students talked about how nurses in placements reacted to them, positively and negatively. Some students talked about the difficulties being a student can cause and the reactions to them, particularly if they question practice. Nine of the 17 students interviewed talked about this potentially difficult position, either in relation to challenging poor practice or the difficulties of being a student on placement. This appears to be compounded by students needing to adapt quickly from one placement setting to another.

Lots of places could do it differently... I find it's quite confusing when you're a student. You go and say, "well I've been taught" or "when you're reading about that, this is the way to do it"... [nurse in practice says] "You're...?"

“Who does she think she is...” and that and you think
“hmm”.

Liz

This quite negative perception of students by the nurses they are working with was found in other students' narratives, but students also included narratives in which attitudes towards them were obviously positive and encouraging. Some students talked about the time that nurses would spend with them, giving them evidence to read, or asking them to look for evidence and come back with information. Stuart gave an example of raising concern about administration of morphine to a patient who was waiting for a pregnancy termination, but was in pain because of gall bladder disease. His concern was taken seriously and the morphine was withheld until more evidence was found. Such varying reactions of practising nurses to students may affect the students' perceptions of what it is to be a nurse in relation to research and EBP. In principle the students all agreed with the tenet that EBP is part of nursing practice, but the narratives gave both positive and negative accounts relating to the nurse as evidence-based practitioner.

A highly positive view of the nurse as an evidence-based practitioner came across in narratives where students talked about nurses as role models. These were often mentors or charge nurses, who encouraged, taught and led by example.

The charge nurses that I've worked with have been brilliant and they'll actually give you the stuff, say "this is what we need you to do". "This is why we do it". "This is, if you don't know, come and ask us". They'll go through it. They'll even draw big pictures on the wall and it has been brilliant to see how your theory links in to your practice, the research and it all links together.

Sandy

The engagement and example-setting in Sandy's extract is set within a larger narrative in which he contrasts different examples of good role modelling with much more negative experiences. The extract also links EBP with a leadership role. A few of the students felt that part of the role of nursing leaders is to promote and support nurses in EBP. Sarah put forward a more radical position, suggesting that there should be champions of EBP, disseminating it to other nurses, but that being evidence-based was not part of the role of most nurses. On looking closer at Sarah's rationale for this position, it was linked to pressures of time and expectations

I don't think it's realistic to expect that a lot of people are going to choose to find the literature and read it. It isn't going to happen

Sarah .

Contrasting with positive role-modelling were other perceptions of nurses having poor attitudes to EBP. A number of the students talked about a defended position in which nurses justify practice by telling students that they have always done something in a particular way.

I just kind of feel that they were very set in their ways and if you questioned anything, you were shot down. You know it was a case of “that’s the way we do it”. End of, kind of thing.

Sally

Sally’s description of such a negative response is not something she condones and this is the case for other students who report such an attitude. However it gives students the perception that some nurses do not value an evidence-based approach. The students’ perceptions of these varying attitudes is that they relate at least partly to the area of healthcare a nurse is working in. Thirteen students included narratives about the differences in nurses’ approaches to EBP depending on their area of practice, with specialist areas being more likely to have strongly positive attitudes to EBP.

I just had a placement in coronary care... if something new comes in everybody gets together and like looks things up and talks about what they’re doing and why. And how should, should that be done and why they do that and

that's maybe the first placement I've had that's more like that. It was really really good. But it's set up to do that and they have more time to do that and more's expected of them. And that was why I liked it. But it isn't like that in 90 per cent of placements.

Sarah

Sarah's description of an EBP focus in this specialist unit is typical of other students' narratives about EBP in such areas. Across the range of narratives about students' perceptions of what practising nurses feel about EBP, there was a mixed set of experiences. The students themselves tended to be discontented with the poor attitudes they came across, because they almost invariably accepted EBP as an integral part of nursing practice. In contrast, when the students talked about nurses as researchers there was a marked difference in the narratives, compared to EBP.

Generally the students perceived that research is something that is not the norm in practice and research was not perceived to be part of the nurse's role. In the second theme (section 4.3) the students' experiences of research studies in practice were discussed, as an aspect of the troublesome practice environment. The 10 students who had witnessed some kind of research being done within a practice environment mainly presented it as an activity at arm's length from everyday practice. While this is probably understandable from the perspective of carrying out

research, it nevertheless gave students the impression of research being set apart from normal nursing practice.

They were still in the middle of trialling that when I was there, so I don't know what the outcomes was. But yeah I think that was one [research study]... I wasn't really involved in it. I didn't think the ward wanted their students kind of involved in stuff like that, but yeah, I just know it was going on.

Jess

For Jess, the impression she had was of students being kept apart from research and this sense of something separate was repeated in other similar narratives. Academic staff may reinforce the separateness of research from being a nurse, perhaps inadvertently. The students all reported very little or no research teaching in their first two years of study and although they could recall an emphasis on the importance of EBP for nursing, there was no such emphasis on research.

The overall perceptions of students about EBP and research, as part of nursing identity, are quite different and these reflect professional standards and norms, in which nurses are expected to be evidence-based in their practice, but are not required to carry out research. The role-modelling by the nurses, who students met in practice, came through as an important way of students developing their understanding of what it

means to be a nurse in relation to research and EBP. The students' perceptions of the nurses they worked with appeared to contribute to their own nursing identity, as an evidence-based practitioner and, to a lesser extent, as a potential researcher. Throughout the interviews the projection by students into their future nursing practice portrayed how they might think and act when qualified and these expectations are explored in the next section.

4.5.2 Joining the nursing community

All the students talked about how they might use evidence as a nurse and seven of them talked about it in both interviews, so in total there were 24 narratives in which students talked about their feelings about using evidence in the future, as part of their nursing role. Thirteen of these narratives were strongly positive about the need for nurses to be evidence-based and the students' aims to base their practice on evidence, staying current. Only two student narratives were negative about EBP, expressing no intention to actively use evidence to support their future practice. The remaining nine narratives expressed mixed feelings about this. Most of them were positive about EBP, as part of being a nurse, but the ambiguity arose when they talked about the practicalities of being an evidence-based practitioner, feeling that other constraints, like time and the influence of habit, might affect their application of evidence in practice.

The two students who did not feel that EBP would be part of their nursing practice had very different reasons for this. For one of them, EBP was viewed as an ideal, but something that was unlikely to be achievable in

reality. The other student simply saw no need for nurses to use evidence. She believed that guidelines would almost always be provided and are always reliable.

When do you ever hear like a nurse critically analysing a guideline on the ward? They don't have time... 'cos we, like you never get a guideline or anything in the ward that hasn't been analysed and I think in the community's the only time you would need to analyse a guideline if they came into place. But I think in the wards they're already done and they would never come into place unless they were peer reviewed or whatever.

Ruth

These views are readily open to challenge and Ruth herself identifies the community setting as an area where she has not found guidelines in use. This position is notable because it is very different from that put forward by other students. Shannon gives a distinct contrast, demonstrating a more developed understanding of EBP than most of the other students.

You've got nursing research and then you've got reflection and then you've got your experiences and how this all ties in together to formulate your practice.

Shannon

In this extract Shannon recognises the need to integrate research knowledge with experience and other skills and in the second interview she also talked about EBP as a skill to be developed over time. A different, but similarly positive view is given by Abby, who situates the need for a nurse to be evidence-based alongside caring and as a personal responsibility as a nurse.

So I choose to nurse somebody so it falls on me to know the best way to nurse that person.

Abby

These strongly positive narratives include EBP as an inherent part of nursing identity. Seven students (across nine interviews), who were more uncertain about EBP in professional practice, related this mainly to the practice setting itself. The main concern was lack of time to find and read evidence, as well as the area they might be working in. Some students suggested that they would be more motivated to keep up to date with evidence if they were working in an area that they were particularly interested in. The concern over lack of time for EBP suggests that some students assign what might be termed a qualified position to EBP as part of the nurse's role. This qualified position is one in which students acknowledge the importance of EBP, but feel that other aspects of the nurse's role take higher priority. In identifying lack of time for finding and reading evidence, these students assign a lower priority to this type of activity. One of the students expressed a concern that he might end up

just following established and habitual practice rather than keeping up to date and although quite a number of students referred to this attitude in nurses they encountered in practice, most of the students felt that they would take a different approach to their future practice.

Overall the students viewed EBP as part of being a nurse. However when it came to the place of research in nursing identity the picture was quite different. This is not unexpected, as research is not embedded into the role of the nurse in the same way as EBP and in the last section a similar view was expressed, relating to students' views of nurses already in practice. Despite this, nursing research may be regarded as an important aspect of nursing as a profession and as a key factor in improving and changing practice, so the students' feelings about research and how it might fit into their own personal nursing identity were explored in the interviews. Fourteen of the 17 students talked about whether they thought doing research might be part of their future practice and four of these students talked about it in both interviews. Notably these four students did not change their attitude to doing research themselves from one interview to the next, so it did not appear that doing the module had changed their views.

Four students were very enthusiastic about doing research and two of them mentioned this in both interviews. These students all linked nursing research strongly to practice and two said that they would like to combine a research role with clinical practice. These students were different to the

others in their certainty about their potential to do research, viewing it as something that they could take on once qualified. One of the students talked about replicating the study she had critiqued, but without the flaws.

... at first I was like, could never do this, ethics and legal and all that stuff to take into account and lit reviews and then, oh, hang on, I did a lit review last year. I'm about to do another one this year, you know, the ethics stuff, you find it, You know where to find the information from. You could. And then by the end I was actually, you could do this. Said to one of the girls, "let's you and me do the future research on this", she was "yeah, let's do it."

Caitlin

Caitlin's belief in her ability to carry out research is partly motivated through realising that components of her degree, other than the module, have prepared her for research. Although her suggestion of repeating the intramuscular injection study that she critiqued is light-hearted, it demonstrates her confidence and positive disposition towards research. Such enthusiasm for research did not equate to the students feeling that research was a core component of being a nurse; rather it was aligned to their personal development.

By contrast, one of the students referred, through both interviews, to her belief that research and reading literature should not be part of most

nurses' roles and that most nurses are not interested in research. Four students said they did not see research as part of their future role. This did not mean that they were dismissive of research per se, just that it was not what they perceived nursing practice to be about and not how they saw their own nursing identity. These students all viewed their nursing role as being bedside and focused on clinical practice, with research being something that would take them away from this. To an extent it was also associated with an expectation of spending their professional life on wards, rather than building a career that might take them away from this.

I don't really have any desire to be a charge nurse... I didn't even know how much money nurses got when I came in to it. I don't care about that.

Mandy

This extract hints at messages from Mandy's narratives that place her own nursing identity as someone who is motivated to care for people and sees nursing as a vocation, rather than a job. Elsewhere in her narratives, she recognises the importance of research for the nursing community, but not as a part of her role. Mandy and Caitlin's narratives exemplify two quite different positions - being very positive about research as a nurse compared to not seeing it as part of the role. Between these two there were a further six students who expressed interest in doing research, but this was tempered by concerns about practical issues and personal confidence. They echoed the sentiments of students like Mandy in placing

clinical practice at the forefront of nursing practice, but saw research as a possibility in the future. For some of these students the potential to do research also linked to the realities of the job market for nursing and a view that doing research might be restricted by what jobs could be found.

The students articulated clearly how they felt that research and EBP fitted in to their role and to nursing identity as a whole. Aside from these personal thoughts and aspirations about using research and EBP in their future nursing practice, the students talked about some of the general challenges of becoming a nurse. One of these was busyness and this came into many of the narratives, both as a statement of the nature of nursing, as well as an explanation for nurses not being evidence or research based. The impression of students was that on most wards nurses have significant pressures of time.

I was in a nursing home actually in Poull, which is a surprising one... it was quite a small unit, seven, maximum of seven residents, so there was the time within that because you weren't running around... And so you could spend your whole time with the charge nurse and discussing things... But you hit another busy ward, busy medical ward or something and there isn't that time unfortunately.

Louise

Louise's narrative around time is typical when she refers to the time available in smaller, specialist units, compared to other healthcare wards and settings. For example Fran uses repetition and emphasis on "very" to describes an admissions ward: "very, very, very busy. Very." The overriding impression in the narratives is that nursing is a time-poor profession. Some students considered this busyness in the context of being a new nurse and having time pressures due to learning about their new environment and new skills. One student offered a somewhat different perspective about time and busyness, suggesting that nurses expect each other, including students, to be constantly busy and to look busy. However most students regarded nurses being short of time as the norm and something that they will encounter in practice.

This time-poor environment is a contributing factor in another challenge that was mentioned by some of the students - the fear or expectation of taking on poor habits and attitudes of other nurses. In the example below Chrissie talks about how and why this might happen.

... you end up going with the flow. It's easier to go with the flow than it is to go against the grain. And to go with the flow means that you're the one that's huffing and puffing about things... I think you have to stay really positive and, kind of, which would then, can then isolate you from your, the team.

I can see why some of the nurses are doing the things they're doing.

Chrissie

Chrissie recognises that being part of the team, conforming to the norms of the community, may lead to adopting behaviours that, as a student, she is uncomfortable with. Other narratives presented a similar view, but some students felt that, as a nurse, they would challenge existing practices. The issue of conformity and being part of the community was not discussed routinely in the interviews, beyond the links to research and EBP, so the process of transitioning into the wider nursing community and into the smaller community of a ward or other healthcare setting was not addressed.

The increasingly academic nature of nursing came through in some narratives and was described by Stuart as a “crisis” for nursing identity.

I'm not even sure if nurses know what nurses are sometimes when I'm there. I don't know... Sometimes it seems like there's a bit of resentment. It has become more academic and sometimes there's an acknowledgement that it has to be more academic. That things have changed.

Stuart

Stuart picks up on the changes in nursing relating to the move of nursing education initially into the HE sector and more recently to becoming an all-graduate profession. He identifies a tension relating to a dislike that nursing is becoming more academic and research focused and yet general acceptance that this is how it is and needs to be. This sentiment is identified by some of the other students when talking about the attitudes of older nurses, who have trained through the traditional, hospital-based apprenticeship model. The students perceived these nurses as being resistant to this change, particularly in relation to EBP.

Em the older ones, the wards that I've worked in... are not changing. They're stuck in their ways, they don't pick up the magazines. They're more interested in just, "we'll care for them, that's [EBP] a doctor's job". "We don't get paid to do..." That's what they kind of see. They won't look at the research. And then when you question them to say, well this is what we've been shown, they'll just go, "well this is the way I do it and that's it."

Sandy

Sandy's narrative goes on to talk about this position in more detail. He contemplates the differences between older nurses, trained in hospitals and younger nurses, educated in HE and sensitised to nursing as a profession. His description of separate groups with "quite a clear line, I think, between the two" directly states a position that comes through more

indirectly in other students' narratives. The concept of change and tension in nursing identity is potentially challenging for the students as they join the nursing community, particularly regarding aspects of nursing such as EBP, that are firmly rooted in the newer, academic approaches to nursing and viewing nursing as a profession.

In the theme of becoming a nurse, the students expressed a mostly positive attitude towards the integration of EBP into their nursing identity, though the possible negative impact of factors like time were acknowledged. This assimilation of EBP into what it means to be a nurse was often in the face of mixed and negative attitudes witnessed in the nursing community and some students acknowledged that despite their expectations and intentions, the reality of nursing practice may lead them to adopt a less positive attitude to using EBP after qualification. In contrast, but as might be expected, research had a lower priority for most students, who did not see research as a core aspect of their nursing identity and had not witnessed research being a common part of the nursing role.

4.6 Academic and professional thresholds

The final theme is in some senses a meta-theme, in that it has partially emerged from two of the other themes, as well as from the data. The notion of learning thresholds is based in the threshold concepts theory that frames the study and the themes related to trouble and transformation are features of learning thresholds. These themes were presented in sections 4.3 and 4.4 and provide part of the foundation for the thresholds theme.

Through the learning narratives, a sense of progress and change prevails, as well as variability in all aspects of the learning experiences that were narrated. Another central message from the data was the influence of practice and university learning and the sometimes tense relationship between the two, in terms of research and EBP learning. A theme of academic and professional learning thresholds for research and EBP emerged from these overarching voices in the narratives, alongside the trouble and transformation themes.

Five threshold concepts are discussed in this theme. Four of these are described as academic and the other is professional in nature. The professional threshold is EBP as a way of thinking and practising (WTP) and academic thresholds are in the areas of critiquing, information skills, terminology and discourse of research, as well as nursing research itself. These thresholds are presented individually here, but their interdependence is discussed in chapter 5. For each of these thresholds a brief rationale is given for why this has been identified as a threshold, along with the nature of the threshold, as it came through in the narratives. An area of learning that was addressed by the majority of students was statistics and numbers. This seemed to cause problems in two quite different ways. For some students they avoided quantitative research because of anxiety over numeracy skills. For other students, who chose the quantitative paper to critique, there were concerns about understanding statistics in particular. Although they seem to be troublesome in nature, statistics and numbers have not been treated as a

threshold for these nursing students, though statistics and quantitative numeracy have been identified as thresholds in other disciplines and subjects (LeBard et al., 2014; Quinnell et al., 2013). It is certainly desirable for nursing students to understand statistical concepts, but they have not been included as a threshold, because they are not essential to becoming an evidence-based practitioner. Understanding numbers and statistics is an important aspect of critiquing quantitative research, but poor understanding of statistics alone would not preclude students from being able to understand and use research evidence.

4.6.1 Evidence-based practice: a way of thinking and practising

An evidence-based nursing practitioner might be defined as someone who integrates EBP through the way they think about evidence and the way they use evidence in practice (Ciliska, 2005). EBP, as a WTP in nursing, is a professional learning threshold because EBP is recognised as a core component of professional nursing behaviour and is associated with best practice and quality patient care. EBP is a different way of thinking about patient care because it shifts away from habit and routine as ways of caring, requiring nurses to question and improve their practice both individually and as a group. This way of thinking about nursing practice necessarily impacts on actual practice, so an evidence-based practitioner is characterised by the integration of EBP principles and skills into their reasoning and practice.

In the narratives this threshold was underpinned by an attitude of acceptance among the students that EBP has an important role to play in

healthcare practice. No student questioned EBP as a pillar of nursing practice and most reported having been told about EBP in their university-based learning throughout the programme. Comments like, “well evidence-based... drummed into us from year one” (Chrissie), were common in the narratives. Chrissie’s use of the phrase “drummed into us” was also quite a common sentiment, so for some students the attitude was one of acceptance mixed with a sense of being resigned to it, not particularly positively. However, this varied from narrative to narrative, sometimes for individual students.

The most fundamental trouble with the evidence-based thinking and practising threshold related to students’ conceptualisations of EBP, identified as troublesome in the sources of trouble theme (section 4.3). In most of the narratives EBP came through as meaning the use of research evidence in practice and this is quite a simplistic view. The notion of EBP as a way of practising also seems to be a source of trouble for the students, because of the very nature of their position as students. By the time of this module, all the students, with probably one exception, seemed to understand the importance of EBP for practice and its value as a way of determining best practice.

I feel like anywhere you go they should have the evidence available to back things up, like even just like moving and handling. Like care of the elderly, obviously you move people about a lot and stuff. You should really have that to

back it up and yeah, I feel everywhere should have it available but I don't feel that's the case.

Jess

This extract shows how Jess has achieved what might be regarded as a mini-threshold of seeing EBP as part of being a nurse, so recognising that thinking about evidence is integral to practice. This is also shown by her reference to evidence being needed, even for what might be seen as a very basic activity, such as moving someone; it is not just for technical or specialist activities. However this extract also demonstrates a troublesome aspect of the threshold that the students are often not free to try out EBP in practice. In threshold terms this limits their ability to assimilate EBP as a WTP into their professional identity, even though they may want to. This issue was identified by eight students who talked about challenging lack of evidence use in practice and the two extracts below demonstrate different outcomes.

...you're just a wee student nurse coming in, newly qualified and you're talking about the best practice and *Better Health, Better Care*²² and all these new policies coming in and they just look at you and say, "well I've never heard of them".

Ruth

²² *Better Health, Better Care* is a Government programme to deliver improved health outcomes across Scotland. <http://www.scotland.gov.uk/Publications/2007/12/11103453/0>

And I just wondered about the filter needles. Were they, could they go both ways? And nobody was sure. So we actually, we actually stopped doing that, because I had asked that question and asked me to look into it and we sat round on Friday and what I had found... we took it from there, just sat round discussing the positives and the negatives.

Stuart

In the first extract the student feels constrained by her position as a student and this reflects the lack of autonomy of practice placements, where students experience practice, but may not be able to use evidence proactively. The second example was unusual in the narratives gathered, but shows how Stuart first demonstrated an orientation to EBP (a way of thinking) when he questioned practice and was subsequently supported by the team he was working with to review and change practice (a way of practising). These examples, in common with other narratives, demonstrate the way in which EBP, as a way of thinking, is largely linked to the development of the student's understanding, whereas EBP as a way of practising is significantly dependent on the experiences they have in practice. In the first theme (section 4.2), the variability of EBP practice experience was explored and for these students the potential for developing EBP as a way of practising seems to be restricted because of the mixed encounters with EBP.

This notion of mixed EBP encounters is a further troublesome element of this threshold. In the diverse sources of trouble theme (section 4.3), two specific areas were found that were sources of trouble and these are likely to affect the students' development into evidence-based practitioners. The first is the dichotomy between university-based and practice learning. In the university setting, EBP is promoted and the students refer to this frequently in the narratives.

... they're always sort of drumming it into you, you know.

Evidence based practice is the way forward and, you know, everything you do has to be evidence-based. You have to sort of question everything

Kayleigh

This view is normal among the students. Yet when the students go into their practice placements they report mixed experiences and often a lack of EBP. Eleven of the students talked about a lack of EBP in practice in at least one of their narratives. The paucity and mixed experiences of EBP in practice are sources of trouble, because it is quite likely to be confusing to students to receive mixed messages from practice and university settings, being told that EBP is important in the latter, but that it is not that important in the former.

EBP, as a WTP, integrates academic skills and concepts that are key elements of EBP and these were identified in the narratives as learning

thresholds that the students had encountered both through their studies and during the module itself. These academic learning thresholds are considered in the remainder of this theme.

4.6.2 Nursing research

Nursing research came through clearly as a threshold because of the way in which it underpins EBP. Students cannot become evidence-based practitioners or researchers, unless they understand the ways that research supports nursing practice and consequently patient care. In the narratives, the nursing research threshold is conveyed as difficult for students from different perspectives. In section 4.3 the term research was discussed as a source of trouble, because it was often used by students in its common usage of searching for or finding out about something. Other facets of this threshold were also expressed in the narrative.

The first of these is about what nursing research is and is not. The sense in the first interview narratives is of research being something quite apart from nursing and Sam expressed this most vividly.

With research I presume it's in a laboratory with a white coat on, somebody who's very clever with numbers.

Sam

Sam's understanding of scientific research is quite removed from the norms in nursing research. His preconception of a researcher being clever

is referred to by other students, in the context of finding it problematic to critique research papers because of assumptions that researchers must be clever. The students also felt initially that if something has been peer-reviewed and published, it must be right. In the second interviews this perspective appeared to change, as the students had been exposed in more detail to nursing research.

Some student aligned their developing understanding of nursing research with their own preferences for qualitative research. Four of the students talked about a feeling that qualitative research is more congruent with nursing than quantitative methods.

I find qualitative a bit easier to, you know, to read... it's quite interesting because it's more, in nursing you're looking at things holistically and I don't really find numbers very holistic to be honest with you. And I think qualitative's more personal.

Shannon

Apart from the small number of students who put forward this view, a larger number talked about difficulties they had with statistics and numbers, including a preference for avoiding quantitative research papers. This seemed to lead to some students' subsequent tendency to focus on qualitative nursing research. Sarah compares this spectrum of quantitative,

qualitative and mixed methodologies with her home discipline of zoology in which lab-based research is the accepted norm.

Qualitative research was really not admired. It was something that was dismissed completely out of hand by everybody that I worked with when I was a student.

Sarah

Identifying more closely with either qualitative or quantitative research may be a way of students managing the broad scope of nursing research methodologies. Students referred to the wide breadth of nursing research they were presented with using terms like “huge”, “massive” and “a mountain”.

Along with the scope of nursing research knowledge is the complexity of research and the research process. In the narratives some students showed that they had developed an awareness of this and integrated it into their understanding of nursing research.

I'd heard of convenience sampling and I just thought random control trials, things like that, but I didn't realise there was so many different types of sampling, blended and mixed methods approaches and stuff. So I thought I understood a little, but, but then when you actually read round, oh there's more to it.

But it makes sense...

Louise

Louise's understanding of the different aspects of nursing research have developed hand in hand with a changed view of its scope. For some students though, this scope and complexity seemed to be avoided and they described how they chose one of the articles to critique and subsequently only looked at content relating to the methodology used in the article. As discussed above, in relation to students' apparent preference for a specific research tradition, often qualitative, this avoidance may have been a way of managing what they felt was an overwhelming amount of knowledge.

Nursing research appears to cause students trouble because of the meaning of the term itself as well as the scope and complexity of the range of research methods and approaches that are used in nursing. As a threshold, nursing research also seems to be transformative and integrative, as demonstrated by the students whose view of research changed significantly between the two interviews, in terms of comprehension of the scope of research and how it contributes to nursing practice.

4.6.3 Research discourse and terminology

Research discourse, including terminology, was identified as a source of trouble in section 4.3 and its changing and transformed use was clear in

the third theme (section 4.4). Discourse is a threshold that underpins both EBP and research, because the ability to understand the language and ways of communicating in research is needed to read and interpret research papers, including conveying the findings. For student nurses the way that research language underpins EBP is more important than being able to use research language in proposals or within research studies, because undergraduate nursing students need to be evidence-based in their practice, whereas they are not required to be researchers.

Discourse and terminology, as sources of trouble, were linked to the diversity and volume of terms that had not previously been encountered by students, either in the university setting or in practice. The students encountered the terminology as a barrier to understanding the meaning and evidence of research papers. As a threshold, the terminology may also be problematic because of the students' nursing identity. For the students their disciplinary discourse is nursing and they often did not associate research with nursing, particularly in the first interview. Even though research underpins EBP, this is not something the students appeared to have encountered during their studies. As discussed, they reported being told about EBP frequently from year 1, but this did not generally seem to have included the use of research terms, as they came to the module largely unaware of the terminology. Sarah reports this as other students being resistant to the terminology.

I don't know how much of it is just the terminology and how much of it is that people feel like they almost shouldn't be doing it. Because there was an element of that... Because I still think that mostly people would rather not be engaging with that part of the process. If you offered everybody I know that's doing the course, the opportunity to have one introduction, introductory lecture at some point to evidence-based practice and the importance of research in nursing and then that would be it, they would have been absolutely ecstatic... for a lot of people it was a chore they had to do to get through... But I don't know how much of that is, is the language.

Sarah

Sarah's narrative points to a complex set of troubles with research discourse, including the scope of the terminology, a perceived lack of synergy between research and nursing, as well as students' resistance to studying research as part of their nursing programme. Sarah's perspective is quite different to other students, because she comes from a position of having been a PhD student before she entered nursing. This makes interpretation of her narrative quite complex and she acknowledged her different position, compared to other students, during the interview. This difference applies equally to her views of research in nursing and to her position in the research interview. She interprets other students' views and

perceptions of research quite negatively, though possibly quite realistically, given her unique perspective.

In contrast to Sarah's view, research discourse comes across in some of the narratives as potentially integrative and transformative. Although the students have been encouraged to read research literature and use it in assignment work throughout their studies, some students referred to seeing research literature in a different way following the module. This suggests that integration of previous activities with undertaking the research and EBP module may have changed their perspectives and understanding.

Before now, in the past, I've just sort of, I've just been looking at the abstracts and part of the discussion and then I look at the, you know, usually the conclusion and it gives you a summary of the whole thing, rather than having to trawl through the whole article, but em, I think now what I'm trying to do is try to look through the whole article rather than look at just the abstract and the conclusion.

Shannon

Shannon is talking here in her first interview and subsequently, in the second interview, she gave examples of how her way of reading articles had changed. These integrative and transformative features of research

discourse were seen in some students and this was discussed in section 4.4 in the theme of degrees of transformation.

Research discourse and terminology also seem to be a threshold concept because they are necessarily bounded for the students. Research discourse is partly bounded for these students because they have not actively used research discourse as researchers. Through developing research knowledge and critiquing skills, they have encountered research discourse by reading, evaluating and writing about researchers' published work. This seems to have had a significant impact on some students, as shown in Shannon's narrative above. However, these experiences take place over a relatively short time period and the students have limited exposure to actively using research discourse in writing, as they critiqued a single paper that was either quantitative or qualitative.

This section has focused on the nature of research discourse and terminology as a threshold concept. Specific terms have not been discussed, though some students talked about terms they found difficult and these were reviewed in section 4.3. In the next two sections, thresholds are identified that have a different focus, as they relate more closely to EBP than research.

4.6.4 Literature searching

Literature searching is the part of information skills that encompasses where to look for research literature and other evidence, how to search

and how to select literature from searches. Literature searching is a threshold not just for EBP but also for nursing education, as students' work is expected to be justified using relevant citations through their studies. Literature searching is characterised by discipline specific databases, as well as generic skills, including accessing appropriate databases, setting up searches, refining these and selecting sources.

All the students talked about some aspect of literature searching skills in at least one of their interviews and they all described literature searching skills as something that had been taught to them from an early stage. A refresher teaching session to prepare them for a literature review assignment in second year was mentioned by many of the students. They were all aware of the expectation to use literature and issues around how to find and access it. Some of the narratives were quite brief so it was not always clear how much these students understood, but many of the narratives gave insight into the students' stage of understanding and how that understanding had changed over the programme.

Students talked about using a range of sources, including CINAHL²³, Medline²⁴, Google Scholar and Internurse²⁵. The students were all aware of differences in quality between sources such as Google or Internurse and comprehensive academic databases, such as CINAHL. This did not always mean that they used the academic sources.

²³ The Cumulative Index of Nursing and Allied Health Literature

²⁴ Healthcare literature database of the US National Library of Medicine

²⁵ Internurse is a database of 13 UK nursing journals published by MA Healthcare Ltd.

Fran: I don't use CINAHL or anything because I don't know how to use it... I get taught. Every time something happens I go, I don't know how to use it. They go "ok, all right I'll show you". So they show me.

LM: are you talking about the librarians? Or anybody?

Fran: Just anybody in general. Then it sticks in there, you go home, you do something else. And then you sit down and go oh oh... I've done it this way [no academic databases]. I've managed to pass doing it this way. Lately I've been using Google Scholar as well, which is bad.

Fran knows that in principle she should be using CINAHL and she seeks out help to use it, but then seems to be unable to retain the knowledge, so she reverts to sources she finds easier to access. The complexity of using academic databases is not the only issue that students raised when talking about why they might not use these. Difficulties accessing these off campus were identified as a problem and, having accessed them, it could be difficult to find resources, whereas using Google Scholar was seen as a way of getting quick and plentiful results, even if the standard of these is poorer. Some students described a transformation in their understanding of using academic search engines and this seems to impact on their understanding of the search process and selection of literature.

First year I got lost in it all and I was finding bits here and finding bits there, but I think a lot of it was just luck to be honest. I wasn't doing it properly and it wasn't until we had the literature, we had a literature review assignment in our 2nd year and somebody, whoever had taken the lecture, had gone through it with us before, and they brought someone else in to, to discuss how to look for exactly what you think you need and they went through it and after that it's been great... But yeah before the, I was kind of just , I was confused... I use, use the University Library or CINAHL, Medline and go through my search. Put what I need into my searches and then hopefully get a lot of results... So yeah, that's how we do it, but before a lot of us were just, I know people were just Googling, people were trying to find anything and it stopped a lot of people using articles before we knew how to do it properly.

Abby

Abby's description of feeling "confused", "lost" and subsequently understanding what databases to use and how to use them, suggests that she has crossed this threshold. In the narrative she goes on to talk about how her use of sources has moved towards journal articles. Other students also talked about being quite reliant on textbooks at first and then the emphasis changing to journals. The rationale for this is implied, though one student talks about the nature of textbook knowledge compared to the

relevant, current research evidence in journals. This notion of selecting quality sources comes through clearly in other narratives where students express a change in understanding. Caitlin talked in detail about the impact two tutorials about literature searching had on her thinking and several times expressed how it had changed her way of thinking about the quality of sources.

So I just remember it trying to change or me trying to change the way I thought about where I was getting information from.

Caitlin

This idea of becoming more selective when searching for literature comes across in four of the second interview narratives. These students all referred to being more discriminating about what they would include as evidence for assignment work. The students did not talk about whether this might impact on how they would use evidence in practice, as nurses. A move to becoming more selective in academic work, coupled with awareness of differences between sources, could influence practice behaviours, though this is not certain.

Other students remained quite uncertain or confused about literature searching. Although they appeared to have a clear understanding of the databases and types of sources they are expected to use, it was less clear whether they felt this was necessary for success or not. In the earlier

narrative from Fran she refers to having always managed to pass assignments without adopting the literature searching process she has been taught. This approach implies a tendency to avoid the difficulty of learning how to reliably search for literature. Other students express such avoidance in different ways. One of these describes, in quite a mixed up way, using journal titles to search. She refers to finding it problematic to use the university databases as they give too much information. In her description, the language she uses seems to reflect her own lack of mastery of the process when she comments about the library search facility “it breaks up all your words and it’s just, it’s too awkward” (Ruth).

The narratives around literature searching portray a set of skills and techniques that the students seem to find quite challenging. Although all the students acknowledge how searching ought to be done, there was quite a clear distinction between a group of students whose language was exemplified by change and others who appeared to be resisting learning that they perceived was difficult or confusing. Generally the students appeared to understand the importance of literature searching, including how it underpins the ability to base practice and academic work on research evidence. Within the context of research and EBP in particular, it is a threshold concept, because it is a necessary skill that underpins literature review work, which itself is critical to research and EBP processes.

4.6.5 Critiquing

The students talked about different aspects of critiquing in both interviews, referring to this as both critiquing and critical analysis. In fact the students' assignment work was more accurately a critical appraisal, but the term critique has been used, because this is what the students referred to throughout the interviews. Critiquing is a threshold concept in a very similar way to literature searching; it is a threshold for research, EBP and nursing education, as students' work is expected to demonstrate critical analysis more and more as they progress through their studies.

Thirteen students included aspects of critiquing in their narratives and one of the principal impressions was of difficulty and the newness of the skill. Some students felt that an introduction to critiquing would have been useful earlier in the course, because this might have helped to make the assignment work less challenging. One of the students expressed a similar idea, suggesting that another similar assignment might help to consolidate and clarify understanding of how to critique.

... having the opportunity to do it again, maybe I'd understand it better. I'd have a better understanding of it, yeah. I'd be able to feel more confident with it. Just it all had to be a bit rushed, you know, I just had to all pack it in. So yeah another one maybe?

Abby

Abby's narrative here reflects other comments she makes about a developing understanding of critiquing, but something she does not feel that she has yet fully understood. Abby gives a clear description of a liminal space and her narrative is filled with expressions like "even now it's, I don't think I fully understand". Other students were less direct about where they felt their understanding had reached, but there is evidence of this liminality in other narratives. For example, some students talked about not being sure about their understanding of critiquing until they received the grade for the assignment. Others associated critiquing with criticising and some were unsure whether their assignment work was critique or too much description.

Description and critique were mentioned by three of the students, one of whom preferred the assignment work because it asked for critique rather than description. The other two felt that it was difficult to critique rather than just describe, though they recognised what the difference is and that they should be moving away from description to more critique. However, they were not sure how to shift the balance. In spite of these challenges most of the students seemed to understand well the benefits of developing critiquing skills, particularly in the context of being more analytical, though one exception stood out.

... critiquing something. I mean we know it's like criticising, to me it's criticising something, that's how I put it. But then don't really, you break it down, put it all back together.

What's the point of doing that? Somebody's already put it together for you. What's the point of putting something together?

Sandy

Unlike the other 12 students who talked about critiquing, Sandy does not see the need to critique and it is also noticeable that he incorrectly equates critique with criticism.

The trouble caused by critiquing seems to be partly due to the focus of the critique, i.e. a research article. Four of the students talked about making assumptions that research articles must be of a high quality by virtue of being published and peer reviewed.

...when I picked my article and I started reading it and I thought oh my God, I actually think this is rubbish. How can I think this is rubbish and I have to critique it? ...Cos these are like proper nurses and proper, they've been published somewhere so there has to be, something behind what they're writing.

Caitlin

This way of thinking about research papers is probably not surprising, given that students are directed to academic journals as reliable sources to use in assignment work. However, this subsequently has the potential

to cause difficulty when asking students to identify any flaws, as well as the strengths. In the assignment for the module, the articles that the students were critiquing had numerous errors and weaknesses. This problem, related to perceptions about research papers, may have been made worse by existing understandings of what a researcher represents and Caitlin alludes to this in the extract above. In another extract Sam positions himself in sharp contrast to the researcher.

I'm just a wee student, so don't want to criticise this
woman's hard work that she's done.

Sam

Sam's use of 'wee' to diminish his status compared to the researcher, who has written the paper, echoes a comment he made in the first interview when he referred to a researcher being "in a laboratory with a white coat on, somebody who's very clever with numbers". These examples of students' preconceptions about the standard of published journal articles and the status of the researchers publishing them demonstrate an aspect of difficulty in critiquing. Students need to put these ideas to one side before they will be able to do the critique itself.

Despite these difficulties, some of the students demonstrated transformed understanding of critiquing. These students used academic and objective language such as "justify", "wider picture" and "different angles" when talking about doing the critique and they also seemed to clearly demarcate

between description and analysis, as well as between the topic of the article and the quality of the article. They were also able to give examples of critiquing to show that they understood what to do.

I'll understand what qualitative and quantitative research is and how that's carried out, so you can kind of look at and be like well, like say an interview's done but it's a quantitative research say, that just wouldn't tie up kind of thing. Yeah I feel more confident doing it now.

Jess

In this example the understanding that an interview would not usually be used for quantitative research shows appreciation of critique as well as some research concepts. Jess also refers to a growing confidence and other students also expressed this.

The transformative process also came through in the way students talked about the potential application of critiquing skills to future study. Some students referred to future assignment work and the need to use critical analysis more. However in terms of EBP, it was noticeable that students referred less to using critiquing skills in this context compared to further study. This may simply be due to the immediacy of other assignment work, compared with being in practice and some students did report feeling more positive towards EBP as a result of the module as a whole, as discussed previously. As in other areas, student experiences of critiquing

were varied and there is evidence that while some students undergo a significant change in their attitude and skills, others do not manage to make this transition.

4.7 Conclusion

As discussed in the first theme, the over-riding sense that emerges from the data is one of variety and complexity around research and EBP for these third year nursing students. This relates not just to the students' approaches to learning, but to the environments in which they learn, their backgrounds and their perceptions of events and experiences. The unstructured narrative interviews enabled this diversity to come through and while variability was the focus for the first theme in this chapter, it was also a foundation for the other themes. Within the second theme, different sources of trouble were identified and for troublesome environments particularly, the diversity of students' experiences in practice appeared to be troublesome.

The third theme, degrees of academic and professional transformation, highlighted the different types of change and development that characterised students' learning about research and EBP, mainly after they had completed the module. This theme was complex, because, for some students, apparent transformations in one area seemed to be contradicted or affected by other aspects of their narratives. This was made more complicated by the nature of narrative: the retelling of the

students' experiences at some distance in time from the experience, as well as the place, people and time of the interview.

A different sort of complexity emerged in the theme of becoming a nurse. This theme was partly drawn from future narratives about how students thought EBP and research might – or might not – be part of their nursing identity, as a member of the nursing community. As in other themes, there was significant variation in the narratives and although they all appeared to agree, in principle, about the importance of EBP to practice, they expressed a range of concerns, ideals, plans and ideas about how they might manage this.

The final threshold concepts theme also reflected the variability and complexity found in the first theme and was based on what was found in the sources of trouble and degrees of transformation themes, because these are two of the principles of threshold concepts. In the theme of academic and professional thresholds, EBP was identified as a WTP and as an overarching professional threshold. This was probably the most problematic of the thresholds found, partly because of the professional component, alongside the academic one. The professional components, as discussed in section 4.6.1, were not easily achievable by these students, because of the nature of their placements, which mean that implementation of EBP is unusual. Four academic thresholds were found that seem to underpin the professional threshold. These are explored

more in the next chapter, including the interactions between them and their relationship with evidence-based thinking and practice.

In the next chapter, the findings will be discussed to uncover what these might mean for research and EBP education within nursing, within the contexts of other related evidence and the theoretical framework of the study.

Chapter 5: Discussion

Although the findings of the study may be of significant interest in their own right, their value and contribution can be enhanced by integrating relevant information, including theory, literature, and policy. This contextualisation of the findings also aims to identify which of these are of most importance and are likely to have most impact for nursing education. In chapter 1 the primary aim of the research was identified as understanding how undergraduate nursing students experience and manage difficulty in learning about research and EBP, based on the premise that nursing students need to be ready to apply evidence in practice when they enter the nursing workforce.

In the last chapter the study findings were discussed and five themes were found (figure 5.1). The discussion chapter uses these themes as a springboard for interpreting the results and showing how they have extended understanding of the ways that undergraduate nursing students learn about research and EBP. The discussion is therefore grounded in the themes from the results chapter, but follows a different structure, reflecting the integration of what was found in the literature review, including the threshold concepts literature and other theory that is woven into the different aspects of the discussion. This enables the discussion to creatively interpret what was found, including both the expected and the unexpected. It also aims to improve the rigour of the study, by situating the findings within the body of thinking that underpins this research. Issues associated with rigour and quality are considered in detail in the final

section of this chapter, to provide a review of the whole research process, and identify strengths and limitations of the study.

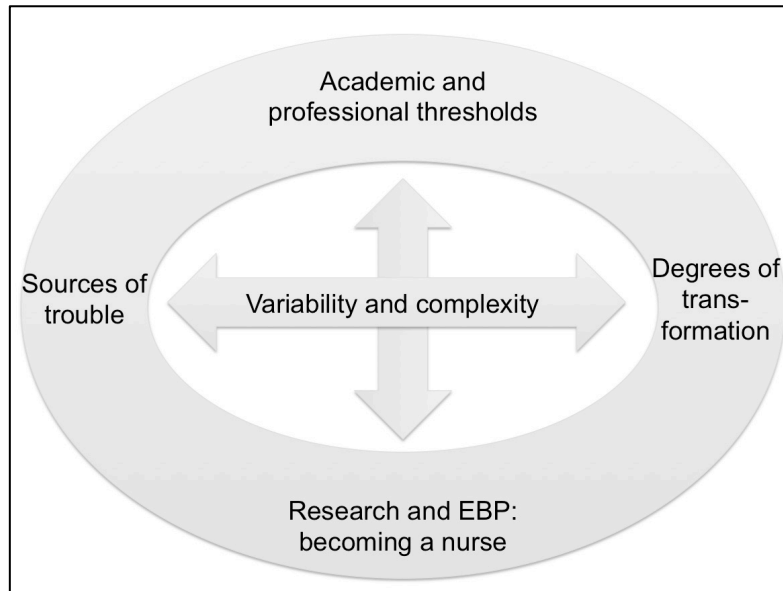


Figure 5.1: Themes from the data analysis

Discussion and interpretation of the study is a way of sifting through the findings to shine a light on what was found, to answer the research questions and explore the key issues (Streubert & Carpenter, 2011). In narrative research, this represents one interpretation of the stories collected, situated within the theoretical framework and related literature (Horsdal, 2012). Although important, the discussion is not an end in itself, but lays the foundation for drawing conclusions, including potential changes to practice and implications for future research, that will be discussed in the final chapter.

5.1 Troublesome environments: complicated practice learning

In the last chapter learning environments were identified as a source of trouble for the students in this study and the practice environment was found to be particularly troublesome for research and EBP learning. Although research and EBP education ostensibly took place in a university setting, within the context of a module of study, the students' narratives revealed a much more complex arena for learning, including practice experiences. The practice environment, as well as the interactions between this and the university setting, are challenging for students, particularly with respect to EBP. This results in a complicated space in which learning occurs that seems to be peculiar to the professional nature of the nursing degree.

Nursing students are quite different to most other students in the number of hours they spend in practice learning settings, even among some other professional qualifications. Across European Union countries nursing students must spend at least 50% of their education (minimum 2300 hours) in clinical settings (European Parliament and the Council of the European Union, 2005). This results in students being exposed to practice from early on in the first year of their studies. In the UK this includes acute and community National Health Service (NHS) settings, as well as the independent and voluntary sector, notably care homes (Royal College of Nursing, 2006). To support this, students are allocated mentors while in practice, who are nurses with training to supervise nursing students,

regulated and monitored by the NMC (Nursing and Midwifery Council, 2008b).

What may seem obvious is that healthcare services in the UK, mainly delivered by the NHS, have a primary function of providing services to patients and their families (Department of Health, 2013). Consequently, this means that student nurses spend much of their education in a setting that is not primarily set up as a learning environment. Despite this, the influence of practice learning is hard to underplay, given its prominent position in the curriculum. In the study it was also a particular source of complication and trouble for students in their research and EBP learning.

The results of the study showed a very wide variety of practice experiences, particularly in relation to EBP. This ranged from highly positive and engaging through being dismissive of EBP and witnessing practice that contradicted current evidence. The students' reports of variability are, to an extent, supported by literature about practice placements. These suggest that experiences in placements can be variable and difficult, with specific areas such as mentoring, balancing academic and practice work and workplace culture noted (Gidman, McIntosh, Melling, & Smith, 2011), as well as stress, lack of mentor support and demanding expectations (Andrews et al., 2006; Morrell & Ridgway, 2014). There is very little evidence about how practice placements contribute to student learning about either research or EBP, though there are many reports of nurses' relative lack of EBP knowledge

and skills, such as Ciliska (2006). This makes it unsurprising that the students reported very mixed experiences of seeing EBP applied, but it is also particularly worrying, given that practice placements are formative experiences, where students learn the behaviours and norms of their future profession.

Students in this study reported a range of problems relating to learning about research and EBP in practice, including lack of mentor support, time pressures and heavy workload for practitioners. Added to this, students often faced problems with using evidence they knew to be up to date and Mattila et al. (2013) also reported that students found it difficult to apply evidence in practice settings. In the study, this was particularly troublesome when students witnessed bad practice and challenged this. Often they were met with defensive responses from practitioners. Such behaviour is not reflected in nursing literature related to research and EBP. Most of the studies that looked at practice-based learning of research and EBP were set up as projects, so the practitioners involved tended to be engaged, though students did sometimes report issues with getting time with clinical staff (Gray, 2010). In contrast, the literature reviewing practice placements is quite similar to the reports of research and EBP in practice from the students in this study, as reported in the last paragraph and the Willis Commission on Nursing Education (2012) also commented on practice support for students as a particular area that requires development.

The variability in practice experiences was reported in chapter 4 and appears to be a troublesome issue for students, though to an extent it is unavoidable. On the one hand healthcare is by nature variable, so students have to accept and normalise this, adapt to the variability and become part of that environment. On the other hand, they are supposed to be learning and observing ways in which university-based learning and teaching relates to practice, to see positive practice experiences.

Variability in the nature of placements, including specialties, size and working practices, seem to be inevitable, but variability in use of evidence (and to a lesser extent research) is more likely to cause trouble. This is because variability, as much as bad practice, seems to be confusing for students, whose professional identity is at a nascent stage.

Schön (1987) recognises the complicated nature of professional practice and the associated difficulty for professional identity and decision-making in practice. He also notes the potential struggle for professionals when problematic and challenging situations “violate their own ethical standards” (p7). Applying Schön’s analysis to education development, Land (2004) identifies difficulties related to combining complex professional decision-making with variability and lack of certainty. For the students in this study, such issues are compounded by their status as students. They are expected to participate in the clinical environment and learn from it among uncertainty and what Schön (1987) describes as “indeterminate zones of practice” (p6). More positively, although some of the students had encountered situations that disturbed their professional values, they did

not have responsibility for clinical decision-making and some of them had reflected on these experiences and identified actions they might approach differently when they entered practice.

In the study becoming an evidence-based practitioner was the specific aspect of professional identity being considered and the students all gave accounts of witnessing different approaches to evidence use during practice placements, from bad practice and lack of evidence use to examples of best practice. Such detail has not been previously reported in nursing education studies, though there are well acknowledged concerns that practising nurses do not engage with EBP (Ciliska, 2006).

To better understand the potential impact of such variability for students, the situated learning framework originally defined by Lave and Wenger (1991) is useful. In the context of Lave and Wenger's work, students in practice environments can be identified as legitimate peripheral participants in a nursing or healthcare community of practice (CoP), whenever they are on placement. This assumes that placements represent an existing CoP into which students can be integrated. Wenger (1998) associates CoPs not just with a group of co-workers or an organisational unit, but also with specific qualities linked to learning and identity. Lave and Wenger (1991) also underlined the learning nature of communities by associating them with Vygotsky's ZPD, emphasising that learning is a social or community based activity (Vygotsky, 1978). In putting students into practice environments to learn, supported by mentors,

there is, at least at a basic level, an expectation that learning will occur and be supported by those in that area (RCN Practice Education Forum, 2007). This includes learning about EBP, though possibly not research to the same extent. However, from the evidence in the study, some practice environments either fail to meet the criteria for being what might be referred to as a community of evidence-based practice (CEBP), or else they have boundaries that act as barriers to students joining the CEBP, even as peripheral members. Wenger et al. (2002) suggest that boundaries of CoPs can be spaces where interaction between existing members and newcomers creates rich learning, but they can also act as a barrier to newcomers, using discourse or other community specific factors to deter learning.

Student narratives suggested that some practice environments did not meet the criteria for being CEBPs, so they were not learning environments, at least from this important perspective of EBP. For example some students described practice environments characterised by busyness, lack of explanations for care given and poor attitudes towards students. In such situations learning about EBP is unlikely to take place and, of more concern, is the possibility of students assuming behaviours that deter adoption of EBP. Some students expressed a worry that, as they moved from being students and into the workplace, they would be drawn into disregarding EBP, because of the need to fit in to the practice environment.

Even when CEBPs could be identified in the narratives, there was evidence of negative boundaries. Wenger et al. (2002) identified discourse as a potential barrier for peripheral participants in CoPs. For the students in this study, it seems that a lack of research and EBP discourse was a barrier at times. Some narratives referred to research language never being used in practice, giving the students the impression that this is not relevant to practice.

More positively, there was also some evidence of CEBPs providing rich learning environments, where the students were integrated into the CEBP by nurses who were research aware and who encouraged them to find evidence for practice. In some cases the CEBPs learnt from students, who used their up to date knowledge to inform the practice settings. Examples of students being encouraged to find evidence for a practice they had challenged and to disseminate what was found to the community were rare. Nonetheless, such examples could provide a model for ensuring that students have positive learning opportunities relating to research and EBP during their placements and also that the placement community could learn from these peripheral participants. Such a model is consistent with the notion of CoP boundaries being places where learning can occur for the existing members as well as for the peripheral participants (Wenger et al., 2002).

A different, but related and useful perspective, is provided by Vygotsky (1978), whose work was the starting point of social constructivism on

which practice learning is modelled. Learning from practice placements is based on the premise that learning is socially situated and that the student builds their own learning through interaction with the practice environment (Lave & Wenger, 1991). However, Vygotsky also put forward the idea of the MKO, the individual in the ZPD who steers the student's learning (Vygotsky, 1978)²⁶. In the context of students' EBP learning in practice, the MKO is usually represented by the mentor. Although students may find others in the environments who they can rely on to support their learning, a mentor is always appointed and represents for the student their guide and teacher during placement (RCN Practice Education Forum, 2007). The students reported a mix of experiences with mentors, from those who closely supported them to others who were virtually absent. Even if students have other nurses to support them, lack of mentor support may impact on their learning. In Vygotsky's model, learning is stimulated by the presence of the MKO and their approach to providing support, rather than the knowledge they have (Chaiklin, 2003). In the context of nursing placements, this suggests that the presence and support of a mentor is crucial for students to be able to capitalise on the placement experience, but that relative absence of the mentor could be detrimental to learning.

Considering placement experiences in the context of CoPs and the MKO, an additional concern is that students may not be aware of problems in placements and, even if they are, they may not have the capacity to address these issues. In the narratives, the student's attitudes and beliefs

²⁶ The most knowledgeable other (MKO) and zone of proximal development (ZPD) are explained in section 3.1.4

appeared to impact on how such situations were handled and this will be considered in more detail in section 5.4. For some, the reaction to poor practice and lack of EBP was to challenge this and to intend to be different as a nurse. Such students were usually those who were older and had more life experience, either in healthcare or in other types of work, family or social experience. Others felt unable to challenge concerns about evidence use in care-giving and voiced concern that once in practice they would adopt the behaviours of the nurses around them, in order to fit in, so effectively perpetuating behaviours linked to practice based on ritual and habit.

The practice learning environment is important for nursing students from the perspective of EBP and a further source of trouble in practice learning relates to the tension between university and clinical settings. The students in this study suggested that there was a theory-practice gap for both EBP and research. With EBP this related to being taught current best practice in the university setting, but this was often not visible in practice settings. As far as research was concerned, the gap was represented by absence of research language and research awareness in practising nurses, during the students' practice experiences. The need to strengthen EBP in the undergraduate curriculum by closing the gap between university and practice is acknowledged in a number of studies that have proactively located EBP learning in clinical environments, to try to address this concern (Gray, 2010; Laaksonen et al., 2013; Zhang et al., 2012). These studies generally reported that such initiatives were successful, but

they did not address the issues raised in this study, that routine practice placements frequently lack EBP in actions and words. Such projects may also be difficult to set up because of the time and labour intensive nature of them (Reising et al., 2008). Furthermore, the evidence in favour of locating EBP education in clinical settings is not conclusive. A large study that gathered data from all 26 universities offering nursing education in Sweden suggests that Swedish students in their final year felt that university based education was better at supporting their developing EBP skills compared to clinical education (Florin et al., 2012). This evidence seems to contradict the findings of project-based studies, though it is not straightforward to compare these, as the Swedish study was a survey of students' experiences in clinical areas throughout their studies.

In the narrative research one student questioned the credibility of university-based staff in their EBP teaching, because of their distance from clinical practice. She felt that university educators lacked understanding of the pressures and realities of practice, making their research and EBP teaching unrealistic. This view was only put forward by one student and is not found elsewhere in published studies, but it does reflect concerns about the EBP curriculum that studies like Gray's (2010) aim to address by linking EBP teaching with practice activities. This student's example hints at an intractable division between practice and academic settings, related to research and EBP, though the marriage of university-based and practice-based learning in professional education is unavoidable and curriculum development needs to recognise and account for such tension.

The practice learning environment can be a challenging place for students to learn and this study found that this was as much to do with variability in application of EBP in practice settings, and to an extent research too, as with students encountering bad practice. This is then further complicated by the tensions between university and practice based learning about research and EBP, characterised by gaps between how EBP in particular is taught in the academic setting compared with experiences in practice.

5.2 Trouble and transformation: challenges in university learning

Leaving aside tensions between practice and academic learning, university-based education is less complicated than the practice environment, in terms of research and EBP, because it is unambiguously a learning environment and the roles of student and teacher are much more clearly understood and regulated. In spite of this, the university learning environment still has challenges. In this study, these broadly fell into two areas: learning about research and EBP during the first two years of study and learning during the research and EBP module.

5.2.1 Research and evidence-based practice in the first two years

There was a distinct difference in the study between how research and EBP were addressed in the first two years of the curriculum, with most students agreeing that EBP was talked about through these early years,

and most students also agreeing that research was addressed only very briefly, if at all. Within the literature there is no comparable evidence and most research studies, evaluations and discussion literature focus on a module of study, rather than looking generally at how research and EBP are taught year by year. There is some suggestion that EBP should be integrated through the curriculum, being included in teaching about different clinical topics (Moch et al., 2010). Certainly the students in this study suggested that this approach was taken, though the language they used, when referring to the way that EBP was regularly reinforced, was often quite negative.

In the study of Swedish nursing students referred to in section 5.1, the students felt that classroom-based learning prepared them better for EBP than practice learning (Florin et al., 2012). This provides some tentative evidence that the approach of including EBP through the university-based curriculum may be beneficial to student learning. What was concerning in this study, was that despite students reporting EBP teaching during years 1 and 2, their conceptualisations of EBP were quite limited, generally equating EBP with using research to support practice.

The students' use of the term EBP suggests that it may be a type of troublesome knowledge referred to by Perkins (2006) as ritual knowledge, which students are unsure how to make use of in practice and which has little importance for them. Although these students did appear to understand, in principle, that EBP is important for nursing practice, they

did not seem to understand the implications for their practice. This may relate to EBP also being conceptually difficult. Given that EBP combines a set of skills, as illustrated in figure 5.2, it is a complex process that is known to be challenging for practising nurses (Kajermo et al., 2010). These students seemed to lack comprehension of the conceptual difficulty of EBP and it is difficult to determine from the research literature in this area, if such limited understanding is mirrored in other undergraduate students. This is partly because most research and evaluation of EBP uses self-reported data, though one study objectively measuring students' knowledge of EBP, before and after teaching on the subject, has shown significant benefits from teaching interventions (Kim et al., 2009).

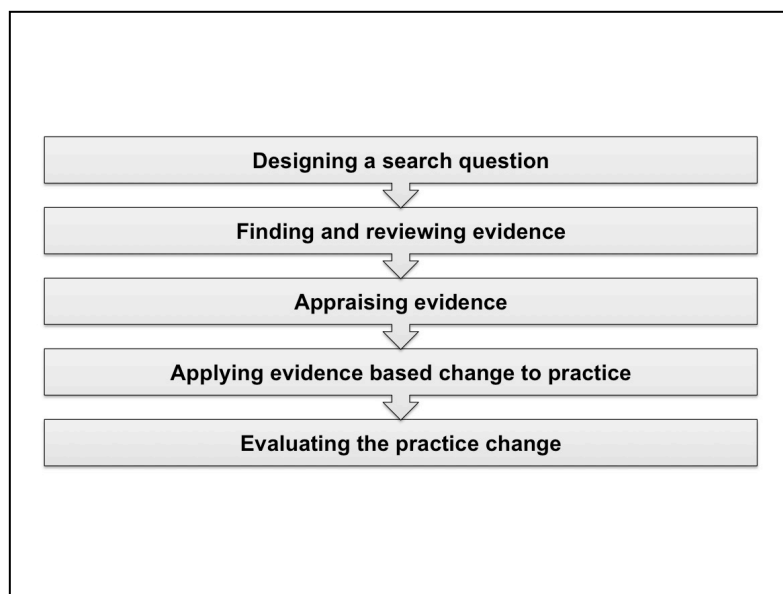


Figure 5.2: Model of evidence-based practice

The approach of embedding EBP across modules makes sense on different levels, as it gives a message about the importance of EBP to clinical topics and also has the advantage of sustaining EBP through the

curriculum, rather than limiting it to a specific module. However, this approach may be challenging, because students may assume that EBP is secondary to the clinical subject being taught and this may be reinforced if EBP is not allocated time in the curriculum in its own right. A second challenge is that embedding EBP through the curriculum assumes that all teachers are competent in teaching EBP consistently and accurately. Given evidence from nursing and nursing education about such competence, this challenge could be significant (Ciliska, 2006).

In this study, research teaching appeared to be less prominent than EBP in the earlier part of the curriculum. It was variously reported by students to be minimal or absent. Students' recall of research teaching was inconsistent and it was impossible to gather whether this was because some did not remember teaching, had not attended the teaching or had attended, but not understood that they were being taught about research methods. Equally it was possible that some students' recall of research teaching was in fact about something different, such as literature searching. There are reports in the nursing literature of students misunderstanding what research is, equating it with searching for information (Ax & Kincade, 2001). Most students felt that they should have had more teaching about research during the first two years because this would have made the research and EBP module that they were about to undertake less daunting.

5.2.2 The research and evidence-based practice module

During the second interview the students gave detailed narratives of their learning experiences during the research and EBP module and this revealed different areas of trouble, but also examples of transformation. In chapter 4, three main sources of trouble were identified for students (knowledge, selves and environments) and these can all be found in the ways that the students experienced the module. Before these are examined in more detail, it is worth briefly considering the general experience of trouble in the module, as a context for the more specific dimensions of trouble.

The students mainly found the module to be less conceptually difficult than they had anticipated at the outset, but that does not mean that they did not find it troublesome. They gave, both overtly and more indirectly, many examples of troublesome learning. To an extent, this is at odds with much of the research evidence in this area, which tends to focus on positive, successful outcomes of research and EBP learning. Research, such as that carried out by Duggleby (1998), is typical in focusing on factors for successful learning. Although this is useful, it misses aspects of learning that may contribute to failure or poor performance. This is also true of evaluations of research and / or EBP modules. For example McCurry and Martins (2010) evaluated which learning activities students “enjoyed the most and that were the most effective” (p279). Similarly August-Brady (2005) reports the positive features of the project she evaluated, making very cursory mention of students experiencing difficulty with finding

literature. Some of the existing literature, notably Ax and Kincade (2001) and MacVicar (1998) does point to areas of trouble, including how students manage this. These areas will be explored in the next section and what this study has added is a more detailed understanding of the trouble nursing students may face when learning about research and EBP.

5.2.2.1 Trouble

For the students, the most obvious source of trouble during the module was troublesome knowledge. In section 5.2.1 EBP was identified as troublesome because it is both conceptually difficult but with elements of ritual knowledge too. During the module, students appeared to focus on research more than EBP, as research constituted most of the module's content, as well as being the main focus in the assignment. Some commented that the inability to apply what they were learning, particularly the articles they were asked to critique, caused trouble. This was mainly because the topics that the articles addressed, such as day surgery and experiences of young fathers, were not always directly relevant to the students' previous practice experiences. The critical appraisal assignment work was aimed at teaching them transferable skills, applicable to practice, but the students' comments underlined that it is perhaps unrealistic to expect undergraduate students to make such links. The issue of relevance to practice is one that is raised quite frequently (Gray, 2010; Mattila & Eriksson, 2007) and a solution to this has been to embed research and EBP learning into clinical areas (Hench et al., 2014; Moch et al., 2010). However, the practicalities of doing this have been questioned, as

providing clinical EBP or research projects for large numbers of students is likely to be very difficult to arrange and manage (Mohide & Matthew-Maich, 2007).

The students found research knowledge to be troublesome in two ways. Before the module they expressed concerns about research being conceptually difficult and, although they mostly felt afterwards that it was not as difficult as they had expected, they did find different aspects of research knowledge troublesome from a conceptual perspective, with examples given, such as rigour and statistical concepts. This is borne out by research literature, which has identified difficulties with research terms and concepts (Ax & Kincade, 2001; Dobratz, 2003; MacVicar, 1998). Furthermore there is a widely held view among educators that research is a topic nursing students find challenging (Porter & Mansour, 2003).

What was perhaps more prevalent was a sense of research concepts being foreign knowledge, which Perkins (2007) defines as knowledge that is at odds with students' underpinning values and attitudes. For the nursing students in this study, research concepts represented foreign knowledge because they are not, at least initially, viewed as part of their emerging nursing identity. In other words, knowing about research is not something needed for being a nurse. One student was affronted that the research module was presented as teaching research principles that could apply across different disciplines. She felt that this undermined nursing knowledge and that if research needed to be taught, it should be in a way

unique to nursing. The belief among undergraduate nursing students, that research is not part of nursing identity, is reported in a review of research teaching in nursing (Porter & Mansour, 2003), as well as in a subsequent study of educators by the same authors (Mansour & Porter, 2008). For the students in this study the foreign nature of research knowledge appeared to relate to having had, at best, very limited exposure to nursing research, either in the classroom or on placements, so research was not something they generally associated with nursing practice.

There appears to be overlap between the trouble of foreign research knowledge and trouble inherent to the students – troublesome selves. Such affective components of trouble are documented in threshold concepts literature, such as Blackburn and Nestel (2014). In the context of nursing education, this trouble is associated with a perceived lack of relevance to nursing, fear of research and lack of interest in the topic (Ax & Kincade, 2001; Halcomb & Peters, 2009). Failure to be interested in research appears to be strongly linked to the perceived irrelevance of research. Students in this study did not encounter research frequently in their practice placements, reported that research language was rarely, if ever, used in placements and also reported having very little research teaching during the first two years. Consequently, some believed that research was not important for being in nursing practice, though this view did not always mean that they were not interested in research. One student was very keen to pursue research in her career, but she nevertheless felt that it was not relevant to most nurses. These attitudes to

research are also reported by Halcomb and Peters (2009), who suggest that poor attitudes towards research in clinical settings perpetuate this type of negativity in undergraduate students. Roberts and Ousey (2011) also found negative attitudes, but in relation to EBP, as students valued teaching about using research literature, but did not feel this would be relevant to clinical practice.

Fear and apprehension of studying research was sometimes expressed quite vociferously by the students in the study, both at the start of the module and when reflecting back on how they had felt, once the module had been completed. This anxiety about research is well documented in research literature, both with respect to research generally (Ax & Kincade, 2001; MacVicar, 1998), as well as in relation to statistics (Hagen, Awosoga, Kellett, & Dei, 2013; Hagen, Awosoga, Kellett, & Damgaard, 2013). Anxiety relating to quantitative research, because of its concern with numeric data, including statistics, was raised by some of the students in the study. They shared a view of themselves as students who inherently did not possess this capability, something Perkins (2007) refers to as the “getting it model of understanding” (p33). As noted earlier, in the case of these students, this meant *not* getting it.

Statistical knowledge was something that students who critiqued the quantitative paper encountered as troublesome knowledge. This underlines the conceptually difficult nature of statistics that may then reinforce a position of statistics being beyond understanding in some

students. This finding in the study is mirrored in threshold concepts literature, in which problems associated with statistics and numeracy are linked to affective components of learning (LeBard et al., 2014). A perceived lack of relevance is put forward as the underlying reason for this, echoing some students' perceptions of the irrelevance of research to nursing found in this study. LeBard et al. (2014) found that medical students did not perceive statistics to be relevant to their chosen profession and they have suggested that statistics may pose a particular problem in professional learning, a position also put forward by Frith and Lloyd (2013). Quinnell et al. (2013) suggested that the problem arises from statistics being part of the hidden curriculum, "what makes a student think and act as a scientist" (p809).

For the students in this study, statistics appeared to be part of an optional curriculum, rather than a hidden curriculum. Although statistics was included in the module syllabus, students could successfully complete the module without engaging with statistics, by critiquing the qualitative paper for their assignment work. This approach may serve to reinforce ambivalent attitudes towards statistics, by presenting statistics as non-essential, despite evidence that statistics and numeracy are important for professional learning (LeBard et al., 2009). Alongside this focus on statistics as part of the research curriculum, a basic understanding of statistics is also important for reading and evaluating research articles, hence for EBP (Polit & Beck, 2010).

Statistics came across in the study as being troublesome for students, adding to the similar evidence from nursing education literature and threshold concepts too. However, as noted above, understanding of statistics has not been identified as a threshold concept in its own right in this study. This is because, although important and part of research discourse, the students' narratives suggested that it was possible to develop skills of EBP without fully developed statistical knowledge and understanding.

The study found trouble across both research and EBP, but the trouble that these students encountered while studying the module related mainly to research. This appears to be partly because the module was focused on research learning and because they had more exposure to teaching about EBP in the first two years of their studies. When looking at the transformations students attained over the course of the module, there is evidence related to EBP, as well as research. This suggests that, despite a focus on research, students can make the connections between research and EBP and these connections help them to shift their understanding of the place of research and EBP in nursing practice.

5.2.2.2 Liminality and transformation

In chapter 4, there were found to be different degrees of transformation among the students who were interviewed after the end of the module. This finding corresponds, in a number of ways, to research carried out by MacVicar (1998) and this will be explored in more detail later in this

section. MacVicar's study followed students through three years of study and focused on research, whereas this study looked at both research and EBP and was over a much shorter timeframe. Broadly speaking, both studies found evidence of students achieving transformed understanding in research, but to different degrees. In the literature review and in the context of the results of the study for this thesis, MacVicar's work stands out because it focuses on longer term and more fundamental changes in student understanding. These may be classed as ontological shifts, where students move from a previously held view to a different perspective of the meaning and relatedness of a topic or discipline (Land et al., 2014).

Other evidence relating to change in research and EBP learning at the undergraduate level in nursing tends to focus on change or improvement, rather than transformation. For example, focusing on EBP, Zhang et al. (2012) found improvements in students' knowledge and attitudes to EBP following interventions over a 2 month period. They describe these changes as achieving "beginning competencies in EBP" (p570) and not a more fundamental shift in understanding of EBP. Similarly, but looking at research learning, Arthur and Wong (2000) found a significant improvement in research orientation and knowledge in students who undertook a 14 week research methods course, but there was only a very small improvement in attitudes that was not statistically significant. Although there is a lack of evidence for transformed understanding, this does not mean that such a fundamental shift in understandings and perceptions of research and EBP are not viewed as important. The large

volume of evaluation and discussion literature about research and EBP education, as well as the smaller body of research evidence, point to efforts in nursing education to find out how best to change students' understanding, attitudes, uses and feelings about research and EBP. Furthermore, studies of educators' aims in teaching nursing research specifically show that they have transformative aims for student learning, such as turning negative perceptions of research, to valuing research in nursing practice (Mansour & Porter, 2008; Porter & Mansour, 2003).

In threshold concepts literature, transformation is preceded by liminality, which is a necessary process for achieving a transformed state and may be characterised by trouble and challenges, as well as by creative work (Land, Meyer, & Baillie, 2010). In this section the characteristics of liminality described by Land et al. (2014) underpin the discussion, as this work has set out a framework that addresses cognitive and affective facets of liminality, as well as pedagogical considerations. Although threshold concepts is a relatively recent development, the theory of transformative learning has been developing since original work in the late 1970s (Mezirow & Marsick, 1978). This work has tended to characterise transformation in terms of the personal actions of the student, characterised by critical reflection, evaluation and self-direction (Mezirow, 2009). Like threshold concepts, the notion of changed perspectives and integrating new knowledge to create different understanding and meaning is central in transformative learning.

In the narrative research work students were asked to talk about their learning processes and strategies, to try to understand how students experienced the liminal space of learning about research and EBP. Most of the literature about undergraduate research and EBP education for nursing either has insufficient detail to inform understanding of the research and EBP liminal space, or else is focused on what went well, rather than processes of managing the challenges of learning. However, Ax and Kincade (2001) found evidence that gives some insight into this. In their study the students found research difficult and confusing, leading at times to a loss of interest. Students in this study reported a similar experience of research learning, from two perspectives.

Firstly some students avoided aspects of research learning that they felt were too difficult. For some students this meant choosing the qualitative study to critique for their assignment, to avoid having to understand statistics and numeric aspects of research. For others, this involved sidestepping particular concepts in the assignment work and focusing instead on a concept they felt more familiar with. For example, one student gave statistical power as an example of something she deliberately avoided. Secondly the confusion and difficulty of research led to non-completion of the assignment work for two of the students. Land et al. (2014) suggest that within threshold concepts such actions are typical of the liminal state, specifically students being resistant to engaging with threshold concepts and resistance is also a theme from the interviews with nursing students carried out by Ax and Kincade (2001).

Land et al. (2014) also propose that liminal spaces are characterised by comprehensions of the concepts that are partial or unfinished and in the study there was evidence that successful learning was associated with students, who were aware that their understanding of research and EBP was still developing. Generally they also viewed this positively. One student, whose research and EBP discourse was confident and who was also highly enthusiastic about research, as part of her nursing identity, expressed a view that she realised after the module just how difficult research was. This captured her changed perspective, as well as her awareness of still having thresholds to negotiate. Other students, who appeared stuck, spoke about research in particular, as a set of knowledge required to pass the module, in order to get a nursing degree. This resonates strongly with Ax and Kincade (2001) who found that some students aimed simply to acquire enough knowledge to pass the exam.

A further sign of liminality was found in students judging confidence above competence. This may be linked to the simplification of EBP in the students' pre-liminal state. This facet of liminality occurs because an earlier simplification of concepts, to aid understanding at that point, subsequently acts as a barrier to students acquiring the more difficult, but required understanding (Land et al., 2014). In this study the students generally expressed being comfortable with EBP, including its meaning and use for practice. However, their conceptualisations of EBP were often quite simplistic and did not show understanding of the set of processes and concepts involved in EBP. Their confidence appeared to be much

stronger than understanding of EBP, though this was not measured or assessed directly. Jacobsen and Andenaes (2011) found a similar issue with final year nursing students and information skills and they found this particularly concerning because these students were about to go into practice. This finding is corroborated by Blackmore (2010), who also looked at information skills, though using a threshold concepts framework, and found that student confidence was much higher than their competence. In the narrative study reported here, this overconfidence may be the result of the simplification of EBP during the earlier years of their studies. Given that EBP was mainly integrated with clinical modules, it is likely that it was referred to tangentially. From the students' narratives, EBP appeared to have been conveyed as using research evidence in practice, rather than as a set of linked steps, as described in EBP models, or as in definitions, which usually emphasise the triad of research evidence, clinical expertise and patient need (Sackett et al., 2000).

The final characteristic of liminality found in the study relates to what Land et al. (2014) have described as "pre-liminal variation" (p210). This refers to the different levels of understanding of related concepts that students possess when they come to a new threshold concept (or a threshold concept at a new level). Although the students' knowledge of research and EBP was not measured, the narratives conveyed a range of experience, engagement, attitude and understanding, all of which might impact on their subsequent learning. For example some students had previous experiences of research work and one of these, a student with a PhD, had

a discourse and attitude around research that was completely different to the other students. Some students expressed a lack of interest in research, feeling it was not relevant, whereas others were enthusiastic about the learning. Such pre-liminal variability helps to explain the diverse reactions to learning about research and EBP, including their liminal experiences. Using the concept of liminality, including the Land et al. framework, to explore the trouble that students talked about in their narratives, underlines the individual nature of research and EBP learning at this level. It also shows that these individual factors relate not just to understanding of conceptually difficult materials, but to attitudes, perceptions and previous learning experiences.

So far this section has focused on liminality, particularly on troublesome aspects of liminality. There was also evidence in the study of successful learning and transformation in understanding. Transformation and change were the focus of a study by MacVicar (1998) that pre-dates threshold concepts. MacVicar followed nursing and midwifery students learning about research over the three years of their programme and identified transformation in their learning that aligns closely with the ideas of ontological shifts and overcoming difficulty that are characteristic of threshold concepts. MacVicar reported that:

It emerged in the course of the year III interviews... that a significant 'connection' had occurred for the students between research as taught and their nursing or midwifery

practice. This seemed to be of crucial importance to the way in which they then perceived their practice. (p1307)

MacVicar goes on to describe three states of transformation, described as a model of “intellectual development” (p1307). This model, in threshold terms, represents different ways or levels at which students have crossed a threshold and transformed their understanding. The students in these three states are referred to as “mergents”, “initiators” and “visionaries” (p1310-1312). This analysis is particularly interesting in the context of the narrative research undertaken, because it describes transformation in a threshold-like way and is also focused on undergraduate research study, both within the curriculum and in relation to practice. In the study undertaken for this thesis, the students did not all appear to successfully transform their understandings of research and EBP. Most of them demonstrated some degree of transformation, though there was a clear spectrum. This ranged from one student who appeared to be stuck in an almost unchanged state, to others who showed understanding of the links between research and EBP, then to others who saw EBP as something they could actively apply to practice and who were enthusiastic about engaging more with nursing research, through reading or doing research.

MacVicar’s categories also reflect a spectrum of transformation and proactive aspects of research are noticeable in this. In her model, mergents understand the symbiosis of research and practice and initiators differ from this in actively disseminating research evidence and being

active in their use of research evidence in practice. Visionaries take this further in their wish to discover and find new approaches and knowledge, to improve their practice. These categories can be seen in students who took part in the narrative research. For example by studying research, some students had recognised the links between research, EBP and practice, whereas others had taken this much further and could identify how they might engage with research themselves, once qualified.

Changed understanding was reported in some other studies. For example Tsai et al. (2014) reported improvements in attitudes to research following research activity and Kim et al. (2009) found improved knowledge and use related to EBP (though no improvements in attitude). However these studies, and others like them, did not address the more fundamental concerns of changing perspectives and meaning-making related to research, EBP and practice. The study by MacVicar (1998) aligns more closely to concepts of transformed understanding and ontological shifts that characterise threshold concepts. Changes like those found by MacVicar, were found in the study, but, as noted above, not all students achieved what MacVicar referred to as mergent. In the post-module interview one student in particular (Ruth) did not see any links between research and EBP, or research and practice and viewed the module as an academic exercise necessary for the degree pathway. Most studies about research and EBP in undergraduate nursing education have focused on positive outcomes from educational interventions, so consequently there is very little reported in the evidence base about failure among students to

learn from research and EBP education. Nevertheless, it is important to recognise that lack of progression is an outcome for some students and it is also helpful to study the different components of success, to try to identify how students can be helped to cross research and EBP thresholds.

5.3 Trouble and identity

In sections 5.1 and 5.2 the trouble that students encountered has been discussed in the context of the different sources across both university and practice settings. In threshold concepts difficulty has typically been characterised by troublesome knowledge (Perkins, 1999), but in this study trouble was found to be more complex and pervasive, affecting many different aspects of learning. This appears to relate to the professional nature of nursing education, which means that students are exposed to different learning environments, attitudes and communities from an early stage.

For nursing students in particular, unlike many other professions, exposure to practice begins very early in their nursing studies and, by law, is at least 50% of their study time (European Parliament and the Council of the European Union, 2005). Furthermore, the practice environment requires students to learn in a space that is not primarily for learning and where cultures and attitudes may be very different to university learning (Gerrish, Ashworth, Lacey, & Bailey, 2008). Schön (1987) raises this as an issue across professional learning, in which the university setting focuses on academic learning, creating a tension with the practice setting,

where learning is expected to be strongly related to practice issues. In the students' narratives, trouble also seemed to be compounded by negative attitudes and perceptions towards both research and EBP, in the students themselves, as well as nurses they came into contact with and this may impact on their developing nursing identity.

To understand this identity trouble better, it is useful to separate research and EBP, because while being evidence-based is agreed to be integral to nursing practice, the role of research is more ambiguous. Some writers, such as Arthur and Wong (2000) and Li et al. (2014), have suggested that actively doing research should be included in the undergraduate curriculum, but for others research learning is associated with becoming an evidence-based practitioner (Dobratz, 2003; Mattila & Eriksson, 2007).

In the first interview in the study, the students did not usually link research utilisation, as part of EBP, with understanding the research process, methods and terms, though by the second interview some had made this link. Equally, most students did not view actively carrying out research as part of their future practice and those who did generally thought this would be a development later in their career. Such a view is not surprising, but failing to separate research knowledge for EBP and research knowledge to undertake research may represent a challenge to learning, as students may not recognise the need to know about research to support evidence-based practice.

In nursing education literature about research a distinction is sometimes made between students consuming and generating research evidence (Kim et al., 2009). What is not clear is whether students understand that both approaches require knowledge and understanding related to research methods and the research process or whether they understand why this is so. In this narrative study the students did not always grasp this and consequently, for some at least, research knowledge was not seen as part of becoming a nurse. This view was reinforced by the way they encountered research in practice, which was mainly peripheral to nursing practice, so learning about research became troublesome. The disassociation of research and nursing identity was identified as an issue by Ax and Kincade (2001) who found that the students they interviewed had not expected research to be part of the nursing curriculum and MacVicar (1998) also found students had negative attitudes towards research in the early part of their nursing studies, linked to fear and anxiety about research.

The link to nursing identity may be further complicated by negative or ambiguous attitudes of practising nurses that were reported by the students in this study. The students' perceptions of some nurses were that they were fearful of research, felt it was too difficult and that it lacked relevance to practice. Caitlin gave an example of nurses who were resistant to reading a journal article because they thought it would be too difficult for them to understand. When set alongside their own sometimes negative experiences and attitudes, it appears that for nursing students,

there may be a complex set of factors impacting on their research learning, that is quite likely to lead them to marginalise research in terms of what it means to be a nurse.

The links between EBP and identity are rather different, because of the more central place of EBP in the undergraduate nursing curriculum. In this study, the students appeared to accept variation in their experiences of EBP in the practice setting as quite normal. However, while developing a sense of what it means to be a nurse, the mixed messages such variation sends out may hamper or even prevent EBP becoming an inherent part of nursing identity. The variation also seems to relate to differing views of EBP in academic and practice settings. The students all reported EBP being part of the academic curriculum, reflecting the norm in nursing education (Roberts & Ousey, 2011), yet they all reported variability in the extent to which EBP was used in practice and this also reflects the findings of other studies, such as Brown, Wickline, Ecoff, and Glaser (2009) and Gerrish et al. (2008). The confusion between what is taught in the classroom and then experienced in practice is likely to impact on how students view EBP in terms of nursing identity, particularly because students may relate more closely with the practice setting, since this represents their future workplace and community.

The development of identity for these students was also bound up in the trouble associated with witnessing bad practice. Evidence from healthcare literature suggests that students often find it difficult to address issues or

concerns they have of practice (Rees, Monrouxe, & McDonald, 2013). In the study for this thesis, a range of narratives of bad practice was given, including reactions to these. From a thresholds perspective, students who felt unable to challenge poor practice appeared to remain in a liminal place following such events, expressing feelings of frustration, coupled with an inability to act, usually because of their position as a student in the setting, a peripheral participant. Some of these students conveyed an underlying narrative of needing to conform and avoiding challenging practice, to be able to fit in and not be viewed as a troublemaker. Others appeared to be able to challenge poor practice and this linked to the student's self-confidence about being right and needing to use best evidence in practice. Some students gave examples of much more positive reactions to questions about practice, from what was clearly a supportive community of practice. Overall, for many of the students, nursing identity related to EBP seemed to be interpreted as going against tradition (if necessary) and aligning individual identity with more academic and professional conceptualisations of nursing that value research evidence and evidence-based decision-making.

The impact of bad experiences, not though necessarily related to use of evidence, has been identified elsewhere in threshold concepts literature, with Blackburn and Nestel (2014) identifying a range of troublesome aspects of surgical education, including the impact of bad experiences. In other health-related threshold concepts work, trouble associated with professional identity has been found to relate to the changing nature of

identity throughout students' initial education (Rodger et al., 2013; Stacey & Stickley, 2012). Such change in identity related to EBP was also noted in some of the students in this study, based on the different narratives and discourses in the two interviews. Such evidence of transformation in identity through a programme of study is encouraging, but the evidence from this study suggests that, unlike students following traditional academic pathways, students in professional programmes are subject to a range of external influences that create varying degrees of trouble. Students who achieve positive transformation and develop a positive professional EBP identity do so in the face of confusion, conflict and challenges to their development into evidence-based and research aware practitioners.

5.4 Evidence-based thinking and practising: a professional threshold concept

In chapter 4, evidence-based thinking and practising was proposed as a professional threshold concept for undergraduate nursing education. McCune and Hounsell (2005) defined ways of thinking and practising (WTP) as a way of describing “the richness, depth and breadth of what students might learn through engagement with a given subject area in a specific context”, that might contain “coming to terms with particular understandings, forms of discourse, values or ways of acting, which are regarded as central to graduate level mastery of a discipline or subject” (p257). This definition focuses on academic learning, but ways of thinking and practising are a potentially useful concept for professional learning as

they encapsulate how specific understandings, values and practices (in this case those associated with EBP) form part of a professional identity. WTP have also been linked to threshold concepts because of their fundamental importance to a subject or discipline and it has been suggested that WTPs should be regarded as threshold concepts in the healthcare professions (Tsang, 2011).

In this thesis WTPs are proposed as being the intersection of professional identity with threshold concepts, as illustrated in figure 5.3.

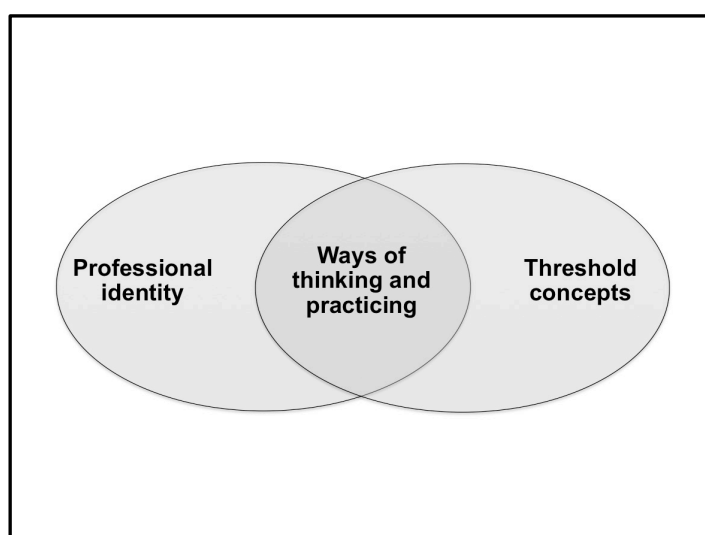


Figure 5.3: Professional learning and identity

WTPs, in the professional context, represent the essences of professional identity, because of the profession-specific discourse, actions, approaches to practice and value systems associated with them. They are also threshold concepts because of the trouble associated with learning them and because of the way in which they demand ontological and

epistemological shifts. In the context of this study, EBP is a WTP (evidence-based thinking and practising), because it is both an essential part of nursing identity and a threshold concept.

Nursing education literature appears to support this perspective, though the language used is different. The idea that EBP is a key aspect of professional identity is widely agreed within nursing and nursing education (Ciliska, 2006) and is also demonstrated in the mandates of regulatory bodies (Nursing and Midwifery Council, 2008a). Although this study is the first to propose EBP as a threshold concept for undergraduate nursing students, Waite, Schutz, Lansdown, Goodman-Brown, and Higgins (2010) have suggested EBP as a threshold in postgraduate nursing education. Returning to undergraduate education, other studies have identified trouble associated with research and EBP learning, notably Ax and Kincade (2001) and the transformative potential of learning to apply research evidence to practice has been clearly identified by MacVicar (1998). Furthermore there is consensus in nursing education literature that EBP is a necessary component of the undergraduate curriculum that underpins future practice (Irvine et al., 2008).

In the last section the different types of trouble associated with nursing identity were reviewed in relation to both research and EBP. The importance of EBP is clear in different aspects of nursing, from the literature base in nursing and nursing education, to policy and regulation, as well as in the research narratives collected for this study. This is

strengthened by similar evidence from other aspects of healthcare, including medicine (Greenhalgh, Howick, & Maskrey, 2014) and the allied health professions (Dizon, Grimmer-Somers, & Kumar, 2012). Although there are concerns about the gap between the ideal of the EBP approach and the realities of what happens in practice (Kajermo et al., 2010), the principle of EBP as part of the nurse's professional identity, to support best practice and patient care is largely undisputed and is visible in current trends across healthcare, such as translational research, quality improvement and e-health (Scott & McSherry, 2009). This view was also voiced by the students in this study, who all acknowledged the importance of EBP for nursing practice and within the undergraduate curriculum.

While the nature and scope of EBP may be clear within nursing, including undergraduate education, what is less clear is how EBP is conceptualised by students and whether they understand it as a WTP. In the study the students were in their final year of study, so some understanding of EBP was expected. As noted above, the students all reported having been told about EBP, but they tended to equate EBP with using research in practice, a finding that is also reported as a problem in the nursing community by Scott and McSherry (2009). This has the potential to both overstate the importance of research evidence and to place undue confidence in research, at the expense of the other components of EBP, i.e. clinical expertise and patient needs.

This position also seemed to be unintentionally reinforced by the module the students took, because of its focus on research methods and critical appraisal. Such an approach is also commonly reported in nursing education literature. For example Florin et al. (2012) itemised six statements measuring “capability beliefs regarding EBP skills” (p892), all of which are about research utilisation²⁷. This approach is understandable, given that research is an integral part of the HE environment and that the clinical expertise and patient need components of EBP are more naturally aligned with the practice environment. However, it has the potential to misconstrue EBP. This might not be problematic if the students were exposed to all facets of EBP while in practice but this did not appear to have been the case, in this study at least. It is difficult to establish whether this is mirrored in other studies. Most of the evidence from the literature review about understanding of EBP lacked detail and often drew on self-reported data, though some more in-depth studies suggested that for some students at least, there might be problems with applying EBP when they move into practice (Brown et al., 2010; Jacobsen & Andenaes, 2011; Kim et al., 2009).

In theoretical work, EBP is commonly modelled as a staged process, from searching for evidence through to evaluation of evidence-based changes

²⁷ These statements are:

- Formulating questions to search for research-based knowledge
- Seeking out relevant knowledge using databases
- Seeking out relevant knowledge using other information sources
- Critically appraising and compiling best knowledge
- Participating in implementation of research-based knowledge in practice
- Participating in evaluating if practice reflects current research-based knowledge (Florin et al., 2012)

(Barker, 2010), but this approach was not apparent in the ways that the students in this study talked about EBP and it was not part of their studies, which focused mainly on research methods. Such a conceptualisation of EBP seems to fall short of EBP as a WTP, as it emphasises a staged and task-based approach, rather than the values and identity focus of WTPs. The focus on technical skills associated with EBP is important but teaching EBP as a set of competencies, misses the opportunity to embed EBP within nursing identity. Despite this, it has the advantage for educators and students of identifying individual components and skills of EBP, as well as the links between them (Titler, 2008). These models are a well-recognised way of implementing EBP, but they are not overtly discussed in most of the literature related to undergraduate EBP curricula in nursing, though individual components of the process are addressed, particularly information skills components (Cader et al., 2006; Stokes & Urquhart, 2011).

It appears that, as far as is known, students' conceptualisations of EBP are quite unsophisticated and potentially troublesome, because they focus on use of research evidence in practice and may not grasp either the different stages of EBP or EBP as a WTP. Since few studies have tried to find out what students understand EBP to be, this supposition is relatively untested, but across discussion and research articles on this topic, the focus is largely on research evidence, so it is not unreasonable to infer that students will generally base their understanding of EBP on this.

Certainly the findings of this study pointed to a relatively simplistic understanding of EBP.

These conceptualisations of EBP, in the study as well as other literature, imply that evidence-based thinking and practising represents tacit knowledge, which Perkins (2007) describes as “the tacit game of the discipline” (p39) and which he links closely to WTPs. This is problematic because students may fail to grasp the complexity of EBP, understanding that EBP includes application of research to practice, but unaware of the means of achieving this and of its association with nursing identity. Failure to make links between the different aspects of EBP is likely to be further complicated by the multipurpose nature of skills associated with EBP. For example, students are likely to encounter literature searching initially as a way of finding evidence to justify what they write in assignment work. Shifting perspectives to view searching as a skill to support nursing practice may be difficult, especially if this use of searching skills is tacit or hidden, i.e. not clearly named as such in the curriculum.

Evidence-based thinking and practising is put forward as a professional threshold concept, with links to identity, which may be troublesome because of its tacit place in the undergraduate nursing curriculum. Although students’ conceptualisations of EBP appear to fall short of EBP as a WTP, there was nevertheless evidence from this study that some students’ ideas about EBP changed after they had completed the research and EBP module. These related to an enhanced understanding of the

inter-relatedness of research and EBP, told by some students as an increased respect for research, because of how it can positively impact on practice. Students also changed how they viewed critical appraisal and their intentions for using research evidence to inform practice. Changes in understanding and attitudes to EBP have also been shown in other studies, though mainly using a quantitative approach, so it is difficult to assess the nuances and detail of such changes (Kim et al., 2009; Zhang et al., 2012).

The importance of WTPs relates to the ways they capture core values and understandings in a discipline (McCune & Hounsell, 2005) and they appear to be of particular importance in professional learning because they combine an academic shift to thinking according to the norms of a discipline with a shift to working according to the norms of a profession. Such a threshold is significant and it can be seen as professional in nature rather than academic. In the next section, academic threshold concepts underpinning the professional threshold of evidence-based thinking and practising are considered, as thresholds in their own right but also as part of a set of thresholds that need to be crossed for students to become evidence-based practitioners.

5.5 Academic and foundation threshold concepts

As already noted, EBP as a WTP may be seen as the culmination of engagement with a series of academic threshold concepts, which were identified in the study as: information skills, critical appraisal; terminology and discourse; and nursing research itself. As well as being academic in

nature, they may also be regarded as foundation threshold concepts in research and EBP, because they underpin the professional threshold of evidence-based thinking and practising. These foundation or academic thresholds need to be negotiated individually, but they also need to be synthesised so that students understand the links and interplay between thresholds.

5.5.1 Nature of the threshold concepts

From an educator's perspective, on an intuitive level, the four academic thresholds identified in the study make sense and, as will be explored below, evidence from nursing and threshold concepts literature lends support to their status as thresholds. However two caveats need to be noted. Firstly, this does not mean that these are the only academic threshold concepts supporting the evidence-based thinking and practising threshold, just that these were the recurrent themes in the narratives that met threshold concepts' criteria, so the thresholds proposed here are a starting point. Mostly obviously, there are likely to be thresholds related to implementation and evaluation of evidence-based change that have not been identified. These relate to the final stages of EBP models and given that the earlier stages of information skills and critical appraisal have been identified as thresholds, it is probable that these later stages are thresholds. However students do not generally have opportunities to instigate evidence-based changes in practice and this may explain why these were not identified as thresholds in the study. In any case, these are not thresholds that fall into the domain of HE, as they would usually be

CPD activities. Secondly, as will be discussed later in this section, these thresholds are all, with the possible exception of critical appraisal, quite wide-ranging topics that may consist of a number of smaller thresholds.

The four academic thresholds address learning in both research and EBP. Information skills and critical appraisal are principally parts of the EBP process, while nursing research and terminology / discourse fall under the research umbrella. The threshold that the students in the study encountered first was information skills, which includes skills associated with literature searching and retrieval. Information skills were found to be troublesome on two levels: the practical skills of using databases and technology to find and access literature; and developing understanding about why technical, academic skills are needed and not just everyday search techniques used for general information discovery. Similar difficulties associated with information skills are also reported in thresholds literature across different subject areas and at different levels of learning. This work has been primarily conducted by library staff, resulting in thresholds that are precisely defined as relating to search strategy development and information structures (Coonan, 2011; Tucker, 2013; Yorke-Barber et al., 2008).

Although presented less articulately, the students in this study also described difficulties with learning about searches and the structure of information within databases and publisher sites, often not realising differences between academic databases and publisher sites. In the

nursing literature, the evidence is less definitive. Some difficulties have been described relating to literature searching (Cader et al., 2006) but generally the evidence comes from self-reported data that suggests positive outcomes from teaching interventions aimed at improving search skills, such as journal clubs (Laaksonen et al., 2013; Mattila et al., 2013).

Possibly the most interesting evidence comes from two studies, one relating to threshold concepts and the other to nursing education.

Blackmore (2010) and Jacobsen and Andenaes (2011) both found that students' confidence in literature searching outstripped their measured ability. This evidence supports classification of information skills as a threshold concept, particularly from the troublesome perspective.

Information skills also appear to be a threshold, due to being a necessary skillset for using evidence in academic or professional contexts.

Information skills are a cornerstone of HE, across disciplinary boundaries, but for healthcare students these skills are also taught to prepare them for professional practice. This makes the threshold particularly important and this can also apply to the related threshold concept of critical appraisal, which has the twin purposes of underpinning both academic and professional activities.

In nursing literature critical appraisal is identified as problematic for undergraduate students as well as for practising nurses. Inability to evaluate literature has been cited as a barrier to EBP for nurses (Brown et al., 2009) and this is mirrored in educational studies, such as Laaksonen

et al. (2013) and Cader et al. (2006), who described “critical and evaluative skills” as “the biggest challenge” (p408). The students interviewed in this study linked critical appraisal quite strongly with critical thinking and their narratives confirmed what has been found in different studies across nursing education, including Rudman et al. (2012), who have suggested that critical thinking is a threshold concept in nursing.

The troublesome nature of critical appraisal and its importance for nursing practice, particularly when considered as a subset of critical thinking, means that identifying it as a threshold concept is unsurprising and uncontroversial. However, some students indicated a source of trouble in critical appraisal that warrants further consideration. From the beginning of the course, students are expected to use evidence to substantiate what they write and are referred to peer-reviewed academic journals, described by some of the students as the “gold standard” of evidence. Students were consequently troubled when asked to critique the very evidence they have been told is high quality. Some felt that it was difficult for them to challenge experts and others were shocked at the errors and lack of rigour in studies they were critiquing. Such an upset to previous values and understandings suggests liminality and trouble are dominant features of this threshold.

Considered together, information skills and critical appraisal demonstrate other threshold features of being bounded and integrative respectively. Information skills are bounded because of the limits to which they can promote understanding. Meyer and Land (2005) define boundedness as

“possessing terminal frontiers, bordering with thresholds into new conceptual spaces” (p374). Looking at information skills from the perspective of EBP models, information skills literally borders critical appraisal, as literature searching and sifting need to precede the appraisal or review process. Information skills are therefore a pre-requisite for a systematic appraisal process within EBP, but they do not include these appraisal skills, so are bounded or limited. By turn, critical appraisal is integrative, a threshold feature in which threshold concepts can reveal links and meanings to other concepts that were previously unknown to the learner (Meyer & Land, 2005). This is because critical appraisal helps to explain and give meaning to information skills, which need the appraisal process to enable literature found to be useful, in terms of both academic work and informing practice.

In contrast to the EBP threshold concepts, thresholds in research are less readily defined. Initially it appeared that there could be many thresholds and the identification in other thresholds literature of research thresholds such as hypothesis development (Taylor, 2006) and development of research questions (Kiley & Wisker, 2010), suggests that many aspects of research could be designated as thresholds. However in the study two concepts came through from the student narratives as thresholds, i.e. nursing research and research terminology and discourse. What needs to be borne in mind with the research thresholds for undergraduate nursing students is the purpose for which research is being taught. For the students in the study research teaching was aimed at helping them to

develop skills in EBP and this purpose of supporting EBP is commonly cited as a reason for including research in the undergraduate nursing curriculum, which Dobratz (2003) refers to as students becoming “consumers of research” (p383). This is quite different to developing research skills for the purpose of undertaking research and although some studies have aimed to teach EBP by involving students actively in research, such as Liou et al. (2013), preparation of evidence-based practitioners is the prime aim in most undergraduate curricula.

In this context, research thresholds help to develop students’ capability to evaluate and appraise, rather than to do. This means that students need to develop a broad and general understanding of principles of research and the value of different types of healthcare research for practice and do not need detailed, in depth knowledge of specific methodologies or research methods. This provides a rationale for the research thresholds identified and also why others (such as developing a research question and statistics) are not thresholds in this context.

In the study the threshold of nursing research was associated with understanding the value of research for nursing practice and what is meant by healthcare research. Some of the students interviewed questioned the relevance of nursing research, though following the module the students often had a better understanding of how research could inform practice. Students also frequently reported feeling overwhelmed and daunted by the prospect of studying research and this finding was

echoed by MacVicar (1998), who found that in first year the students she interviewed were apprehensive about research. Such feelings about research are likely to cause trouble for students and although there is no specific evidence relating poor attitudes or confidence with understanding of research, Stokes and Urquhart (2011) reported that self-efficacy in information skills significantly impacted on students' achievements in this related area. Ax and Kincade (2001) also found that research was difficult for students, aggravated by misunderstanding of the term research. The students equated research with literature review and this was similar to some students in this study who described searching for information as research. Such findings suggest that the concept of research represents foreign knowledge for some students, which Perkins (2006) defines as knowledge that students find puzzling, contrary to their existing knowledge-set. Research seems to be troublesome from a number of perspectives, related to both the students and to the meaning and components of research. However research is also a threshold because if students do not understand the nature of nursing research and accept its value for practice, then becoming an evidence-based practitioner will be beyond their reach.

The students frequently identified terminology as an area of difficulty, both generally as well as for specific terms and concepts. Meyer and Land (2005) say of discourse "It is hard to imagine any shift in perspective that is not simultaneously accompanied by (or occasioned through) an extension of the student's use of language" (p374). Ax and Kincade (2001)

reported that the nursing students they interviewed found research terminology to be an area of difficulty. Just like the students involved in this narrative study, Ax and Kincade noted that students were being expected to learn a wide range of new terms and concepts in a short space of time, given that the module in question ran over one semester. This timeframe for research and EBP modules was also quite typical through the literature.

Dobratz (2003) asked students about research terminology and 43% of the students surveyed reported being “intimidated by research language and terminology” (p387). This finding is supported by the evidence from this study. The students talked about finding terminology difficult, though they felt that this was due mainly to time constraints. Most of them did not think that research terminology was inherently more difficult than nursing or healthcare discourse and attributed the trouble with terminology and discourse to lack of time. They also suggested that regularly hearing nursing language being used in practice settings, as well as in the classroom, helped them to learn and understand the terms, unlike research. A notable exception to this was one student who had already completed a PhD and who felt that research terminology was more complex than nursing language. This student’s unique perspective, as part of the nursing student community, but having had a scientific research training, suggests that students may be underestimating the difficulty and scope of research discourse. Alternatively, her views may reflect the

challenges of assessing levels of trouble and complexity from beyond thresholds, a point noted by Kneebone (2009).

5.5.2 Synthesising the thresholds

The thresholds discussed in this section are not necessarily a definitive set but they represent those that were encountered by the students in the study. These findings were largely supported by evidence from other sources, but becoming an evidence-based practitioner also requires the synthesis and integration of these thresholds. Meyer and Land (2005) suggest that, within a curriculum, issues related to structuring and aligning thresholds need to be considered and this seems to be relevant for EBP.

As discussed at the beginning of this section, the academic threshold concepts identified are the foundation for the professional threshold of evidence-based thinking and practising. This raises questions of how students assimilate and integrate the foundation thresholds. It was noted in section 5.5.1 that information skills and critical appraisal act like neighbouring thresholds, with information skills preceding critical appraisal.

The research thresholds might also be viewed as neighbours, since passing over the nursing research threshold is linked to an acquisition of research discourse. In this case nursing research is bounded, because a student may perceive nursing research as valuable and relevant and may also understand the scope of healthcare research, but their comprehension will necessarily be limited until they can understand research terms and adopt a research discourse.

The synthesis of the research thresholds with critical appraisal is less straightforward. Information skills are related to knowledge of research, but are not dependent on understanding particular aspects of research. However critical appraisal assumes an understanding of the research process and language. In this respect the association of critical appraisal with critical thinking becomes rather troublesome. This association was made at times by students in this study, who often did not differentiate between the two. Critical thinking, as a more general skill, does not rely on research understanding, whereas critical appraisal is focused on evaluation of research, so some understanding of research is essential.

There seems to be considerable interaction and linkage between the different academic thresholds identified in the study. These co-dependent thresholds raise the spectre of students faced by multiple doorways, unsure of where to go first and how to get from one to the other. The four academic, or foundation, thresholds resemble a jigsaw, with all pieces needing to be in place before the full picture emerges. The full picture in this case is the professional threshold of evidence-based thinking and practising. This consequently raises a further problem, namely whether acquisition of the four thresholds adds up to the professional threshold. In short, this is unlikely to be the case since, as noted in section 5.4, EBP requires skills that are practice based. However, it might be expected that acquisition of the academic thresholds will at least bring the evidence-based thinking and practising threshold into view, ensuring that students

have begun to negotiate the professional threshold and understand what they are trying to achieve.

These issues, including the professional and academic nature of different thresholds, as well as the need to synthesise them, bring implications for curriculum design and delivery. In designing the research and EBP curriculum, this poses a problem of how to sequence and relate the thresholds without overwhelming students. In the limited publications that have defined an undergraduate nursing curriculum for research, the range of methodologies, methods and skills covered appears to be vast, including methodologies from both qualitative and quantitative paradigms as well as the range of sampling, data collection and data analysis methods (Harrison et al., 2005; Irvine et al., 2008). In addition to this, the EBP curriculum typically appears to include literature searching, critical appraisal, development of clinical questions and evaluation of applicability to practice (Fineout-Overholt & Johnston, 2005). This seems to risk putting quantity before quality and perhaps rote learning before understanding.

One means of overcoming this may be to base the research and EBP curriculum more overtly on the thresholds that have been identified, not just in the study, but also in related nursing and thresholds literature, such as Waite et al. (2010). This would help to address the ultimate goal of becoming an evidence-based practitioner more holistically, enabling connections between the thresholds to be made more overt. It also suggests that a rephrasing of threshold concepts could be useful for EBP

at least and the notion of foundation or academic thresholds underpinning the professional threshold of evidence-based thinking and practising may be potentially useful.

The findings of the study suggest that there are two further issues for students encountering these thresholds. The first is that they encounter the thresholds for different purposes, and this may not even be disclosed overtly to them. For example the threshold of critical appraisal is necessary to be an evidence-based practitioner. However the students also need to critically appraise literature (and indeed any published source) as an academic skill, important for assignments and coursework. This suggests that thresholds may be characterised by elements of tacit knowledge and this was already proposed as an issue for evidence-based thinking and practising in section 5.4. Others looking at thresholds in healthcare have suggested that threshold concepts are often part of the hidden curriculum (Kinchin et al., 2011; Tsang, 2011). While the hidden curriculum seems to be a useful and interesting perspective for looking at threshold concepts, in the current context of undergraduate research and EBP education in nursing, tacit knowledge is more relevant. This is partly because tacit knowledge is an element of troublesome knowledge. Using this term helps to distinguish this type of trouble from other aspects of troublesome knowledge, such as ritual or foreign knowledge (Perkins, 2007) that have been shown to be relevant to research and EBP learning.

The hidden curriculum has similarities with tacit knowledge, embodying what Margolis et al. (2001) refer to as what lies “behind the scenes” (p3) though the hidden curriculum is usually linked to formal education and the rules and knowledge needed for belonging to a particular class or community (Ehrensals, 2001). Tacit knowledge has a similar focus but can refer to knowledge systems in any setting, referring to values and norms (such as WTPs) that Watson (2006) referred to as “unstated” or “taken for granted” (p208). This application to any setting makes tacit knowledge a more appropriate concept to apply to thresholds related to research and EBP in nursing education, given that learning occurs within clinical practice settings, as well as in the university. The tacit nature of research and EBP thresholds may also be linked to an issue raised by Kneebone (2009) in relation to medical education, i.e. that it can be difficult for educators to teach threshold concepts effectively because of their own position of being beyond the threshold. In terms of tacit knowledge related to research and EBP thresholds, knowledge that teachers perceive as overt and clear about research and EBP may in fact be quite the opposite for students. This includes the academic thresholds discussed in this section, as well as the professional threshold of evidence-based thinking and practising. Educators may then unwittingly perpetuate students’ inability to see interrelatedness of these thresholds or how they contribute towards nursing identity.

A further issue for undergraduate students encountering research and EBP thresholds is the unfinished nature of the thresholds in relation to

being an evidence-based practitioner. In section 5.2.1 the EBP model was described and includes implementation and evaluation of practice change. As has also been discussed earlier, thresholds associated with implementing and evaluating practice change are usually not achievable during undergraduate study, because the students' time in practice placements does not normally offer opportunities for such activities. The students in this study did not have any opportunities to change practice during placements, with the exception of one student who had been involved in a team-based change, though he was not able to evaluate that change. Some research and evaluation studies have been carried out that have enabled students to undertake evidence-based change projects in practice, such as Gray (2010) and Mohide and Matthew-Maich (2007). These have shown that this can be a positive experience for the students and helps to develop their understanding of EBP, but these studies appeared to be time-consuming and labour intensive and there is no evidence of such an approach being used with a large class of students. This is problematic because it undermines the aim of nursing students being evidence-based on graduation. Indeed it makes such an aim unachievable and this issue will be considered further in the conclusions and recommendations presented in chapter 6.

5.6 Rigour, reflexivity and reflection: a personal account

Chapters 1 to 5 have presented my account of the research study undertaken for the PhD, from the underpinning rationale to the research itself and the interpretation of the results. In this section the focus will be

on quality, the process of verifying how much confidence can be placed in the study's results and conclusions. Of course, part of this process takes place through peer review, including critique of publications and reports arising from the research (Cohen et al., 2011).

It is also important, as the researcher, to self-appraise and examine my own role in the study, particularly the analysis of the narratives collected. Personal influences are important in any research study and in narrative research these are often a particular consideration because of the importance of positionality and the role of the researcher (Chase, 2013). Taking a reflexive approach, through identifying the different stimuli that have affected the research process, can help to identify how I have affected the research, both positively and negatively. This process of self-examination subsequently benefits the quality of the research (Peshkin, 2001). Within the context of the doctorate, it was also helpful to reflect on my personal learning and progress through the study, so this has also been presented in the final part of this section. As discussed in section 1.6.1 this section has been written in the first person, reflecting the emphasis on personal review and reflection.

There are three parts to this quality review: rigour, reflexivity and reflection. The approach to rigour was outlined in chapter 3 and my analysis is based on an adapted version of the framework put forward by Riessman (2008) for a situated truth (figure 5.4). Using this framework will help to establish how, or indeed whether, my analysis and interpretation of the data is a fair

and credible representation. Riessman refers to reflexivity as a component of quality and this part of the discussion will focus on my position in the research, as well as the different facets of my role and persona and how they might have impacted on the research. Reflexivity has been treated as a separate component because, although it contributes to the rigour of a study, it is researcher-focused, whereas the other elements are criteria against which to review a study. Finally, I have included reflection on the study, focusing on some of the personal learning thresholds that have been particularly meaningful for me. From one perspective this was a highly individual activity that helped me personally to review where doctoral study has taken me, but reflection also helped to show how my learning and position as a novice narrative researcher might have affected the outcomes of the study.

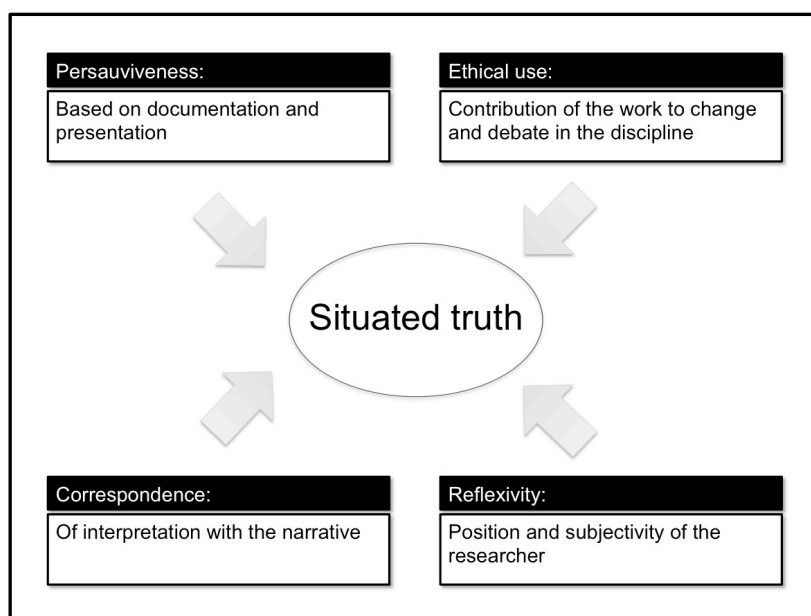


Figure 5.4: Quality criteria based on Riessman (2008)

5.6.1 Rigour

The value of qualitative research in the scientific community has often been questioned, based on issues of quality and rigour and these critiques have been linked to the evidence movement with its emphasis on positivist approaches (Torrance, 2013). It is perhaps ironic that for this study, so pre-occupied with the use of research evidence in healthcare, I decided to take a qualitative approach. However, qualitative researchers have argued that the multiple interpretations and perspectives of these methodologies should be valued and, for this study, using narrative research was an appropriate way to answer the research question, given its potential to uncover the detailed stories of student learning. Eldershaw, Mayan, and Winkler (2007) reported an interview with Art Frank, a well-respected narrative researcher, who argues that truth is necessarily situated and that individual narratives should be valued. This aligns well with the model of situated truth (Riessman, 2008) being used in this study.

5.6.1.1 Persuasiveness

Persuasiveness is concerned with ways in which the components of the study match with narrative research methods, including congruence between these. The data collection was carried out using in-depth narrative interviews and these are a common method in narrative research (Holloway & Freshwater, 2007). Specifically, in this study, the aim was to collect experience-based narratives, based on four criteria defined by Squire (2008), in which narratives:

- Are sequential and meaningful
- Are definitively human
- 'Re-present' experience, reconstituting it, as well as expressing it
- Display transformation or change.

(Squire, 2008 p42).

The interviews in the study gave students the opportunity to tell their learning experiences in their own words and from their own perspectives. Individual interviews helped avoid influence from other people and my position, as someone who had never taught these students or their peers, may have helped in enabling them to give their own views and stories freely, without adapting them to account for the teacher-student relationship or influence. Certainly, some narratives were quite critical of academic staff and this suggests that the students felt secure enough to open up to me. However, the students all knew that I was a member of staff and the interviews took place in the university, so this had to be kept in mind when interpreting their stories.

To try to make the narratives natural and student driven, I used an unstructured approach. This meant asking all the students the same opening question, but after that, the students largely dictated the course of the interview. For example in interview 2, some students went quickly into talking about the assignment work, whereas others focused at first on how they approached the module content. A key aspect of my role was to probe deeper, asking for examples or more information and to make sure

that all aspects of learning about research and EBP were covered by the end of the interview. Change and transformation were often revealed naturally because the narratives were all about learning and the students usually talked about their changing understandings without much prompting. These features also came through by having two interviews. This allowed me to identify how the students' discourse and thinking had changed from one interview to the next and also enabled the students to reflect on the processes of learning, including changes in thinking and attitudes.

In the data analysis, approaches overtly related to narrative research were used. Although narrative analysis is adaptable and creative (Riessman, 2008), as a novice narrative researcher, it was helpful to follow criteria that have been tried and found useful by established narrative researchers. Initially a thematic narrative analysis was used and I followed this by identifying narratives as the unit of analysis, rather than phrases or words. To do this a narrative was defined as a story about a particular experience, perception or event, though it was not always easy to delineate these. To make sure that this did not adversely affect my analysis, I applied multiple codes to each narrative, to make sure that all the meanings were logged that came through from the students. Along with this, I used a dialogic analysis and this was included to help ensure that the thematic analysis presented a trustworthy interpretation. In the dialogic analysis context was considered, which meant focusing on points such as how the students expressed themselves and the particular language used.

The persuasiveness of this study lies predominantly in using established approaches to narrative research and these helped to ensure that appropriate techniques and tools were used. I also purposefully chose approaches to data collection and analysis that were congruent with each other, to try to make sure that interpretations emerged from a logical and coherent process.

5.6.1.2 Correspondence

Unlike persuasiveness, which is concerned with the different parts of a narrative research study, correspondence focuses on data analysis and interpretation. It refers to the ways that the findings of the study can be shown to have their basis in the narratives themselves. In the thesis, this is relevant to the derivation of the themes from the raw data and to the interpretation of those themes in the discussion points. To derive the themes I used a systematic process to help ensure that there was good correspondence between the narratives and the themes.

As indicated in figure 5.5, which shows the data analysis process, this took place over two cycles, as I analysed the two interview sets separately. This helped to verify the process and, as some of the codes were used across both interviews, it also acted as a crosscheck that the codes were appropriate for the data.

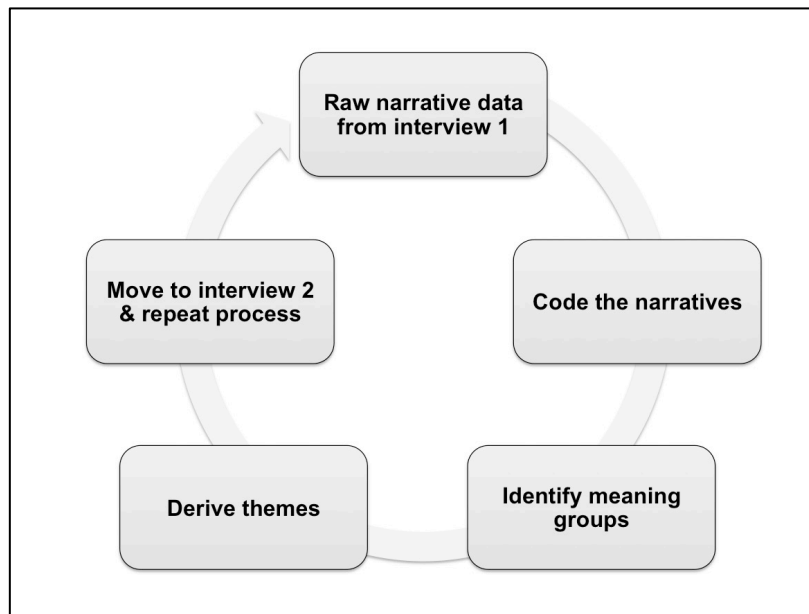


Figure 5.5: Process of deriving themes

During the writing up process the themes were illustrated by frequently using direct quotes from the data, to ensure that the themes genuinely reflected what the students had said. Because of the narrative nature of the study, some of these quotes were quite long, but I found that this was necessary to capture and contextualise the sense of the narrative.

Although representativeness is not a particular concern in narrative research, it was important for me to make sure that all the students' voices were heard when presenting the findings. This helped to avoid over-reporting a particular viewpoint and to stay true to the principle that the variety of individual learning experiences needed to be understood. To do this, I kept a log of how many quotes were included from each student.

This did not mean that there was an exact balance among all students, as that could have led to quotes seeming contrived, but it made sure that all the students were heard. The thematic analysis was supplemented by a

dialogic analysis. Dialogic analysis takes into account issues such as how narratives are expressed and the context in which an interview takes place (Riessman 2008). Using this alongside the thematic analysis helped to make sure that quotes were not misinterpreted or taken out of context.

One of the challenges of narrative research is that data can be interpreted in different ways and, for me, this meant that it was particularly important to overtly justify a particular interpretation of the data, to avoid criticisms of misinterpretation. Along with the systematic approach and use of direct quotes described above, I used the theoretical framework, particularly threshold concepts, to inform the coding and interpretation. This helped to anchor the data analysis process, using theory to guide and justify the interpretive process. In writing the discussion chapter I also drew on literature, mainly from the literature review, and this also helped to ensure that the interpretation of my findings was situated within the existing body of evidence.

5.6.1.3 Ethical use

Riessman refers to the “ethical use” criterion as “political and ethical use” for “social change” (2008, p196). This is apt across a range of social sciences (for example in criminology, women’s studies or political science). In an educational study, the idea of social change is less relevant, so the criterion was adapted. I refocused ethical use as the need for the study to contribute to the evidence base and to continuing debate and development in the area of the study. The study has contributed to the

evidence base in three areas: topic, theoretical approach; and methodology.

Firstly the study has extended understanding of the topics of research and EBP in undergraduate nursing education by looking in detail at how students learn about these topics and specifically their difficulties and transformations. This perspective has not been taken before, particularly in looking at research and EBP together and also by focusing on difficulty. The study is also the first to use threshold concepts as a theoretical lens for looking at this topic. Introducing threshold concepts theory and other threshold concepts literature, has helped me to unpick and explain the difficulties encountered by the students. Finally, the narrative research approach has not previously been used to explore research and EBP education in nursing and even qualitative studies are relatively rare. Although the study has broadened understanding using these three different perspectives, it was also deliberately grounded in the existing literature base, aiming to build on what was already known. From these perspectives the study has added to the evidence base and meets the criterion of ethical use, but it is also important to note that this was a relatively small-scale study in one school of nursing, so the importance of the evidence is limited by this.

The recommendations for practice and research are set out in chapter 6 and the ethical use criteria expects narrative research studies to take findings into the areas of practice and policy development, to help to

ensure that the research has impact, in this case in the field of nursing education. The results of this study have some significant and possibly controversial implications. These relate to research and EBP education in nursing, to the curriculum in undergraduate education and beyond to postgraduate education and CPD.

These implications will be discussed in chapter 6, but the other important aspect of having practice implications from a research study is to make sure that these are disseminated and encourage debate. Such dissemination activities can take place at local, national and international levels and this will depend on the nature of the results (Rallis & Rossman, 2012). Although the results of this study have yet to be widely disseminated, some presentations of my work have already been given and plans for publications are underway.

5.6.1.4 Limitations of the study

The sections above have identified some of the strengths and weaknesses of the study in the context of quality criteria used. There are several other limitations of the study that should be noted before moving on to the reflexivity section. A significant limitation of the study is that it was a single centre study, though I recruited students from two different campuses. The students in the study were all exposed to the same research and EBP curriculum and some of the findings may have been different if students from another university, with a different curriculum, had been interviewed. There is also a concern over the students who took part. Although the

sample was nominally a random sample, I had quite a poor response rate and it is quite likely that it was more motivated or able students who came forward to take part. Efforts to improve the response rate were made by sending personalised emails, having the module leader introduce the study during a lecture and sending out a reminder email. However I had to balance this and avoid students feeling that they were being coerced into taking part. Related to this, some students did not give a second interview and this meant that some student voices might be regarded as incomplete. I was disappointed not be able to interview one student in particular after the module. This student withdrew from the module, although he had been quite positive and confident in the first interview. Given that the research was specifically focusing on difficulty, it would have been interesting to interview him to find out what had gone wrong that had led to him not completing, but he did not respond to either email asking him for another interview.

As this was a doctoral study, I undertook the data analysis individually and although it was discussed and reviewed along with my supervisors, the analysis and interpretation are mine. While this is expected in this type of study, under other circumstances, it would have been helpful to have more than one person carrying out data analysis, to provide triangulation and verification. When proposing threshold concepts as an approach to educational research Cousin (2009) suggests that this should ideally be done as collaborative research and this is a weakness in this study.

5.6.2 Reflexivity

Riessman (2008) refers to the need for reflexivity and it is widely acknowledged that this is an important aspect of qualitative research (Bradbury-Jones, 2007; Cousin, 2010). Reflexivity is about the researcher's awareness of his or her subjectivities and position in the context of the research and Lincoln et al. (2013) present this as an active and demanding process of self-questioning that permeates the research process. At this point it is useful to clarify the difference between reflexivity and reflection, as reflection will be considered in section 5.6.3. For this thesis reflexivity refers to the impact I have had on the research study, including the role, beliefs and perceptions I brought to the study.

Reflection refers to the impact the study has had on me, including how I learnt and developed through undertaking doctoral study. The ability to be reflexive, to continually self-assess and review my impact, has been included as an important quality criterion in the study, to help to demonstrate and enhance the integrity of the interpretive process and to contribute to meaningful interpretation of the narratives (Bradbury-Jones, 2007).

Reflexivity is an important aspect of rigour in the qualitative research process, because it helps us, as researchers, to identify and challenge our own presumptions, beliefs and histories and to consider how they have impacted on the research, both positively, negatively or just in a neutral way (Streubert & Carpenter, 2011). In narrative research this is particularly important because the nature of this methodology highlights positionality

and the role of the researcher as central to the data collection process and to the analysis of narratives (Cousin, 2010).

Such a view originates in the theoretical underpinnings of narrative research, notably Bruner, Ricoeur and Bakhtin. For Bruner and Ricoeur narrative is the way we make meaning out of life (Bruner, 1987; Ricoeur, 1991) and for me this meant this I had to be conscious that the students being interviewed were offering, in narratives, their interpretations of their learning experiences. These narratives were likely to be formed partly by the students' impressions and perspective of me, as the interviewer, but I was also conscious that from the very moment of listening to the students I was myself experiencing an interview, interacting with their narratives and starting my own interpretation of what they said. Such interaction is a fundamental aspect of Bakhtin's work on voice (Bakhtin, 1981) as he views every speech and conversation as being affected by the relationship between the voices. In terms of my study, Bakhtin's work suggests a need to keep the co-dependence of the narrative, the relational view of it, central to my interpretation. These views of narrative impacted on both the data collection and analysis processes.

Bearing in mind the narrative theory referred to above, I have viewed reflexivity in this study from the perspectives of roles and beliefs, identifying how these have affected the study. This study was, of course, rooted in healthcare education and, from the beginning, I was aware of having a role of "not being a nurse or healthcare professional". I was

initially undecided about whether or not to tell the students about this, but decided not to say anything about my own background, apart from being a member of academic staff (who does not teach undergraduates) and that I was studying for a doctorate. The students mainly seemed to assume that I would not know much about their practice experiences and this was helpful, because they provided detail and explanations without making assumptions about my knowledge. They assumed that I would know about the module and the university system, though, which was not surprising.

When listening to the students talking about their practice experiences, at times I felt myself tending towards being quite critical of some of the nurses who students encountered in practice. I have consciously tried to remind myself that, having not had those experiences, I cannot know the pressures or previous experiences that have led them to behave in the ways reported by the students. I was also hearing the students' interpretations of other peoples' actions and it was these perceptions and retold events that were my concern, rather than the actual actions of nurses. At times, a lack of personal experience of working in healthcare has been useful, because I was able to take the students' narratives as they were, without having any previous socialisation to clinical settings that might affect the interpretation. That said, I have naturally had experience of healthcare settings as a patient and relative and have a socialisation to healthcare, as someone involved in nursing education. These multifaceted perspectives, as the researcher, reminded me that "we have to live with complicated truths" (Frank, 2010 p10).

I was surprised at the quantity and depth of the narratives that students related, without exception, about their practice placements. In hindsight, this was perhaps to be expected, but my surprise reflected my own position as someone who has not been a student in professional healthcare education and whose educational background is of conventional, on-campus study. Add to this my lack of undergraduate nursing teaching and I had underestimated the influence of the practice experience on student learning, as well as the challenges posed by this model of half practice, half classroom learning.

The unstructured nature of the interviews meant that my lack of knowledge did not impact negatively on this, as the students were able to talk freely about this aspect of their learning. In fact, my position may have been helpful as I was able to absorb the stories they told without significant preconceptions or expectations. When discussing practice experiences I also had to strike a balance between giving students freedom to relate what they wanted to and keeping a focus on research and EBP. In the data analysis, any narratives not related to these topics were discounted, as they were not relevant to the research questions. An example of this that was particularly striking came from Chrissie, who talked in some detail about her mother who had qualified as a nurse only seven years previously. She talked about her mother's role working in an addiction team and her decision to return to a ward-based role, which was very interesting and appeared to have influenced Chrissie's own attitudes to nursing, but it was excluded as a research and EBP learning narrative,

because it was grounded in ideas around what it means to be a nurse, without any relation to research and EBP. There were some other interesting aspects of learning and nursing / student identity that came through in a number of the narratives, but these were not within the scope of this research study, so I excluded these. However, one of the appealing aspects of narrative research is the recognition that narratives can be analysed and interpreted in different ways, depending on the researcher, the focus of the research, the context etc. With this in mind, it may be feasible to look into these other facets at a later time.

The second role that I perceived might affect the research was being an educator. The students gave more narratives that included criticism of the university and nursing education than I had expected and I was reassured that they seemed to be open about their experiences, though some at least, may have wanted to tell me about negative experiences or issues because they knew that I worked in the school of nursing concerned. It was also noticeable that they mainly avoided naming members of staff and particularly if they were criticising any aspect of the module or programme.

Being a researcher mostly subsumed my perspective as an educator and I was surprised how easy it was to switch off from the educator role and to take in the narratives as stories to study and be interested in for themselves. When I was analysing the data, I found myself, at times, thinking about how I might change my own research and EBP teaching, but I was mainly able to focus on the data in a research-minded way.

The other role that affected how I have analysed the data and also managed the study as a whole is a past role. I have found that my previous degree studies, particular undergraduate study, were quite influential on the study. My first degree was a joint honours Master of Arts in Economics and French. Initially I could see that studying research methodology in my economics study had given me an enthusiasm for research methods that has remained with me. I also realised that my French honours dissertation, a literary criticism, had given me enthusiasm for creatively appraising and evaluating literature. What was perhaps most important about this past role was my background in academic disciplines, whereas the students I was interviewing were in a professional degree programme. I had not realised the significance of the differences between academic and professional study and this subsequently increased the importance I attached to the practice environment and professional study when analysing and interpreting the data.

This role also made me aware of the beliefs I hold about HE and the inherent value of academic study, for itself, as well as for developing generic skills for career development. I had not appreciated the different view that most of the students would have of their studies, because they had come into the programme to become a nurse. It was challenging to try to set aside these beliefs. To an extent, it has been useful to look at research and EBP education in nursing with this alternative perspective on academic study, but it was troublesome too. This is because I risked applying my own values or expectations of academic study to these

nursing students, who naturally and rightly had a different goal for their studies, that of becoming a nurse.

This belief about HE is also linked to my beliefs and attitudes towards research and EBP, as being not just interesting, but of fundamental importance for healthcare practice. I found that some students were somewhat apologetic when they referred to not being very interested in research in particular. This was a useful reminder of needing to bear in mind that to these students research was a very minor part of their studies and that EBP, though perhaps important to them, was one of a range of essential parts of their studies and was never given as a driver for entering nursing.

Overall, it was useful to be aware of the roles and beliefs that I hold, which have affected the study. Most of these have had both positive and negative effects, but throughout the process, narrative research, with its acknowledgement of multiple truths, the positionality of the researcher and the situated nature of narratives, has helped to keep my subjectivities in mind through the research process and to acknowledge the effects they have had on the study.

5.6.3 Reflection on personal thresholds

In reflecting through the course of the study, it has been impossible not to think about the study in terms of my own thresholds. In the context of students attaining key milestones in doctoral education, Kiley and Wisker (2010) have referred to this as “conceptual threshold crossings” (p399).

Some of the thresholds that I have experienced may not be truly threshold concepts, but, from a personal learning perspective, it was useful to apply the thresholds way of thinking, because it helped me to manage troublesome events and experiences, or at least to recognise them as such. It also helped me to identify what I had learnt, so this section sets out three thresholds that were particularly important for me.

5.6.3.1 Accepting liminality

Over the course of my studies, I have gradually understood the importance of time to think and deliberate that includes sometimes letting go of order and accepting confusion and liminality, as a positive feature of learning. Using threshold concepts theory in the research was useful for me in understanding and accepting this, because threshold concepts acted as a continual reminder of the difficulty of doctoral learning. It was also a reminder that this level of study is meant to be difficult and it is important to be patient and let ideas develop. The title of Art Frank’s text, “Letting Stories Breathe” (Frank, 2010), converted for me into a mantra of “let ideas breathe”.

In the early days of the work, I found it more challenging to embrace this difficulty and spent most of a two week summer study leave period stuck over data analysis methods, well before I had even finished data collection. I ruminated on narrative analysis, as well as discourse analysis, and by the end of the time felt, at best, not much wiser and, at worst, more confused. I thought I had lost precious study time. Much later, I realised that the time was not wasted and that this deliberation and confusion is time-consuming but necessary. It helped with making sure that sound, reasoned choices were made about the research process and also helped me to understand the choices I had rejected.

Later in my studies I managed to embrace this type of activity and liminality became a more creative than stuck place. This was most apparent to me during the writing up phase. I came to the discussion chapter feeling quite excited, because it is, as I regularly tell Masters dissertation students, an opportunity to show creativity, to interpret and synthesise and the chance to tell your own story. However I spent much more time preparing to write this chapter than I had planned. At first I wondered if I was avoiding the chapter, but really I just needed time to mull over, think, explore and challenge my own thoughts and then to construct my interpretation and to be sure that it was true to me and to the students I had interviewed. Even after starting to write I changed the structure and story of the discussion chapter twice more, but the result felt more robust and coherent. This example helps to demonstrate how the acceptance of liminality has made me more open to taking time to ponder

and deliberate. As an integral and positive aspect of doctoral study, it is a way of challenging my understandings of all aspects of my study and ultimately learning more.

5.6.3.2 Becoming a researcher

Becoming a researcher is possibly the most obvious threshold for a doctoral student. I had been involved in a range of research work before starting my studies, but always as part of other people's work. The sense of ownership that comes with doctoral study has been, for me, of fundamental importance in being able to think of myself as a researcher (a novice one at least). Tasks such as applying for ethical approval, recruiting students, collecting data and analysing that data varied in the complexity involved, but they have all given me confidence and a sense of personal achievement. For me, truly regarding myself as a researcher has been something that has required me to go through every stage of the doctoral – and research – process. It is only coming to the end of the cycle, with writing up, that it seems possible feel like a researcher.

This sense of being a researcher has also been influenced by others around me and is perhaps unlike other thresholds in this regard. Attitudes and reactions of colleagues and peers, as well as supervisors and mentors, have been important. I was fortunate in having a large support group, partly because of working in an academic environment and those around me were always encouraging and helpful. However, as time went on and my own confidence in discussing and debating research progressed, I felt an increasing sense of moving from being a peripheral

member of communities of research practice to being a member of these communities.

Apart from this, a further influence on becoming a researcher was my experience of teaching research and EBP skills at undergraduate and postgraduate levels. Undertaking doctoral research study has helped me to feel more credible as a research teacher, but teaching research also helped me significantly in crossing the threshold of becoming a researcher, because I already understood the different aspects of the research process, as well as other skills, such as literature searching and appraisal. Experiences of supervising Masters dissertation students was also formative, as I was able to critique and review my own work using the principles and techniques I apply with dissertation students. From a different perspective, the process of doctoral study has frequently been a reminder of how challenging and new research can be for undergraduate and Masters students alike. My immersion into doing research has, for me, highlighted how difficult it can be to remember what learning research and EBP is like. More than that, I need to remember that I have never learnt about research and EBP as a nursing student or practising nurse, so my expectations and attitudes are quite different. While my own enthusiasm for research and EBP teaching is strong, it is easy to forget that students often do not share the same feelings.

5.6.3.3 Qualitative thinking

One of the first thresholds I encountered was the qualitative way of thinking and specifically the narrative research way of thinking. Previously, I had only undertaken quantitative research and evaluation and my research thinking was quite strongly positivist. Learning to think and act qualitatively was at once quite challenging and quite liberating, because it opened up completely new ways of conceptualising research. It was an ontological shift and an epistemological one too, because of the completely different ways that qualitative researchers uncover new knowledge, view reality and build meaning. This was one threshold I felt was relatively quick to cross.

The literature around narrative research is quite diverse in content and focus. In many parts it draws on philosophical ideas that I found difficult to understand. However, narrative research and its associated ideas were quickly appealing to me and also seemed to align with my own personal views of how people make sense of what happens to them, so I felt quite strongly motivated to learn and even enjoyed mastering a difficult concept. I also started to immerse myself in qualitative research, as part of the proposal development and preparation for doctoral study. This meant that even from quite early on in my studies I felt ‘in tune’ with qualitative ways of thinking. Even if I still had to build up my knowledge of concepts and principles, I had crossed the threshold of thinking like a qualitative researcher.

Part of learning to think qualitatively involved accepting a degree of chaos and shifting perspectives, as not just acceptable, but even good. My own preference for order and logic hampered this to an extent. Although a systematic approach is generally useful, I found that at times it could be a restraint, perhaps becoming too rigid, because I needed to be open to multiple possibilities and interpretations and let them settle. This meant that allowing myself some degree of disorderly thinking was positive. This aspect of qualitative thinking intersects with the threshold described above of accepting liminality. It highlights for me a sense that thresholds may be individually navigated, but that there is sometimes a cumulative impact that is more than just the combination of individual thresholds. This cumulative impact is difficult to articulate, though, so I have to be content with a sense of having learnt and developed and still having potential to learn and develop further.

5.7 Conclusion

This chapter has identified the key messages that emerged from the results of the data analysis and has discussed these in the context of relevant literature and theory. The over-arching messages that come from the discussion centre around two related areas. Firstly students' research and EBP learning occurs within settings that are filled with trouble and this comes from the environments they learn in. It also relates to the attitudes and perceptions of research and EBP they come with, as well as those they see in others. Knowledge associated with research and EBP is also troublesome, but in different ways and not just because it is conceptually

difficult, which tends to be the rhetoric found in the literature. The second area of interest is the academic research and EBP thresholds found in undergraduate nursing education, which are closely linked to the professional threshold of evidence-based thinking and practising. The thresholds found in the research can also be identified in related literature and they appear to fit threshold criteria well. The academic and professional thresholds were found to be co-dependent and jigsaw-like, something that might itself be threshold-like for students to cross.

The discussion has used research evidence, other literature and theory to explain the results of the study and in particular threshold concepts literature has informed the study. This represents a particular perspective on the experiences of the students that might be labelled a situated interpretation. Finally, section 5.6 of this chapter has scrutinised the quality of the study, including the interpretation, by reviewing criteria for rigour in narrative studies, alongside a reflexive and reflective account.

Chapter 6: Conclusions and recommendations

In research the horizon recedes as we advance ...And
research is always incomplete.

Mark Pattison in *Isaac Casaubon* (1892)

This study set out to explore the difficulties encountered by undergraduate nursing students when they are learning about research and EBP. It also aimed to identify concepts that students encountered, which can lead to transformed understanding of research and EBP, using thresholds concepts theory as a framework. Answering the research questions linked to these aims is the end point of a journey that has delved into the students' learning experiences. It found that these encompassed not just a finite period of modular learning about research and EBP, but exposure to these topics throughout their studies, particularly EBP, in both classroom and practice settings. These experiences were varied and informative and although they focused on research and EBP, they merged at times with other, wider boundaries such as nursing identity, professional learning and the undergraduate curriculum.

The preceding chapters have addressed the different aspects of the study, but research and EBP education, threshold concepts and difficulty have all been threaded through them and this final chapter aims to pull these threads together by returning to the research questions and drawing conclusions from what was found in the study. This chapter also looks

forward and the quote from educationalist Mark Pattison at the start of the chapter captures the sense that research studies keep pushing the boundaries of knowledge, while also uncovering more that is yet to be known and discovered (Pattison, 1892). The potential for follow-on research is discussed, but the other important consideration is the implication of the work for practice. Practice implications are reviewed from the perspectives of curriculum development and the broader context of research and EBP in nursing education.

6.1 Revisiting the research question: key findings

In chapter 2 the research questions were identified as:

- How do undergraduate nursing students experience and manage difficulty in learning about research and evidence-based practice?
- Which threshold concepts do undergraduate nursing students encounter when learning about research and evidence-based practice?

The 30 narratives, collected across two interviews from 17 students, provided answers to these questions and some of these were expected, also reflecting evidence from other literature, but others were less predictable and had not been recorded previously in published work. The study found that the students experienced different types of difficulty and challenges that fell into three broad areas of trouble: knowledge, selves

and environments. The ways and extent to which students managed trouble varied from student to student and also depended on where they encountered the difficulty, most notably whether this was in the practice or university setting. The difficulties associated with research were quite different compared to those related to EBP. Research difficulty was more strongly linked to knowledge, understanding and attitudes whereas EBP difficulties were often linked to the learning environments, as well as to attitudes, though for EBP the attitudes of others were often troublesome, as well as personal attitudes or beliefs.

When looking at threshold concepts, the students in this study described four key academic thresholds, two of which were principally associated with EBP and the others with research. Along with this, a professional threshold – EBP as a WTP – was identified. To cross this threshold, it was proposed that it would be necessary, but not sufficient, for the academic thresholds to be mastered. Through identifying the thresholds, the study also uncovered some of the ways in which students changed their understanding and crossed the thresholds and this was of interest because this level of detail is largely absent from existing literature and the only study that gave this type of detail about research learning is over 15 years old (MacVicar, 1998). From these findings, conclusions and recommendations can be derived that aim to help to improve research and EBP education in the undergraduate curriculum, across both practice and university settings.

6.2 Conclusions

The study suggests that those delivering research and EBP education in undergraduate nursing programmes need to take the different types of difficulty into account, that were identified in this study as sources of trouble. The work of Perkins (2007) supports this conclusion; he proposed that teachers should develop their own theories of educational difficulty and this notion also stresses the importance for teachers to acknowledge and address difficulty. As discussed in chapter 5, some research and evaluation evidence about teaching research and EBP to undergraduate nurses recognises that students have difficulties learning about these. However, student learning about research and EBP in nursing is frequently researched by developing teaching and learning interventions that are evaluated by looking at attainment, rather than by investigating the nature of difficulty. This study suggests that difficulty may be more multifaceted and complicated than has previously been found and that it needs to be addressed, not simply through teaching interventions, but in exploring issues associated with attitudes, nursing identity, practice experience, as well as learning and teaching.

Difficulty was found to be a significant and complex feature of research and EBP learning. Threshold concepts theory focuses overtly on difficulty, so this is proposed as a potential model for curriculum development in these topics. Four important areas of academic learning linked to research and EBP were found that meet the criteria for threshold concepts: critical appraisal; information skills; research terminology; and nursing research.

Evidence from both nursing education and threshold concepts literature offers some support for the findings of the study that these are thresholds and taking into account evidence that students find research and EBP difficult generally, there is potential to remodel the research and EBP curriculum using threshold concepts as the basis for learning and teaching. This conclusion offers a way of delineating the research and EBP curriculum by focusing on what Land, Cousin, Meyer, and Davies (2006) have identified as the “jewels in the curriculum” (p198). The study also found some ways in which the thresholds identified link to each other, sequentially and concurrently, overlapping and bordering each other. These links and interdependencies may also be significant in developing the research and EBP curriculum as they provide some insight into how student learning might be sequenced and teaching activities structured.

Along with these four academic or foundation threshold concepts, one professional threshold was found, i.e. evidence-based thinking and practising. Various, the literature review and student narratives presented EBP on a spectrum, from quite simply using research evidence in practice, through to a more complex set of steps to integrate evidence and improve practice. The threshold concepts literature and other related educational literature proposes that attributes and ways of knowing that are fundamental to a discipline are in fact ways of thinking and practising (McCune & Hounsell, 2005). This study concluded that EBP is, or should be, a WTP in nursing, as well as a threshold concept, because it is integral to the role of a nurse, underpinning professional practice. This makes it

more than a set of steps or a way of using knowledge, because it implies that it should be part of a nurse's identity, requiring an ontological shift. This would be demonstrated by practice that is grounded in using evidence as part of everyday practice and by a discourse that is naturally orientated towards research and EBP.

Ironically, along with this conclusion goes another that may seem initially to be contradictory, i.e. that the expectation for student nurses to be ready for EBP on graduation, as mandated by the Nursing and Midwifery Council in the UK (Nursing and Midwifery Council, 2008a), is unrealistic. This study, in common with some others, such as Jacobsen and Andenaes (2011), found that students lacked key skills required for EBP. The students interviewed generally reported that they felt quite confident about EBP, but their research knowledge appeared to be much more tentative. Furthermore, despite a general confidence in EBP, the students' notions of EBP were quite unsophisticated and, unsurprisingly, they did not appear to have had opportunities to implement and evaluate EBP changes. Indeed, although students can develop information skills and critical appraisal skills during their studies, the other aspects of EBP are all largely absent from the undergraduate curriculum. This includes: identifying practice problems; implementing change; integrating clinical expertise and patient needs in finding solutions; and evaluating evidence-based change. These are also difficult to integrate within undergraduate nursing education, as demonstrated by the small-scale nature of practice-based research and

EBP teaching projects reported in the literature (Gray, 2010; Liou et al., 2013; Reising et al., 2008).

This means that the mandate of regulatory bodies, including the NMC, for students to be ready for EBP on entering practice, is unrealistic. Taken further, this may mean that CPD activities, that are essential to support development into evidence-based practitioners, are not put in place, because the assumption is made that students arrive in practice with all the principles of EBP in place. Such a conclusion may be controversial, as it rests partially on an assumption that EBP is a WTP and that some aspects of EBP are not practical to include in the undergraduate curriculum. There is some evidence from other literature that reinforces this conclusion. It suggests that the implementation and evaluation phases of EBP are not usually part of the undergraduate nursing curriculum (Gray, 2010; Laaksonen et al., 2013) and other more conclusive evidence about a lack of research utilisation in nursing and healthcare also supports this view (Horsley et al., 2011; Kajermo et al., 2010). Furthermore, EBP seems to meet the conditions suggested by McCune and Hounsell (2005) for being a WTP, as discussed in chapter 5. From a different perspective, the case for EBP as a WTP can be traced back to some of the original work about EBP, which presented EBP as a new way of thinking in healthcare (Evidence-Based Medicine Working Group, 1992).

Recommendations for practice change and further research activities can be identified, based on these conclusions and the next two sections lay

out the ways in which this research study might contribute to future developments in nursing education and research associated with research and EBP.

6.3 Recommendations for practice

Those involved in nursing education regularly exhort educators involved in teaching student nurses to “practice what they preach” by using evidence-based educational practices in curriculum design and delivery (Emerson & Records, 2008). The evidence from this study needs to be contextualized and kept in perspective, particularly given that it included a relatively small number of students from a single school of nursing. However, taken as part of a body of evidence that includes literature from undergraduate nursing research and EBP education, as well as from threshold concepts, evidence-based recommendations can be identified that aim to improve students’ learning and their learning experiences. These recommendations vary in their focus, as some are likely to be more useful at a local level for individual educators or teams, whereas others aim to contribute to debate that is needed at national level.

6.3.1 Local curriculum development

The first recommendation is the use of threshold concepts as the basis for curriculum development in undergraduate nursing research and EBP education and the study findings point to some possible avenues for this. One implication of using threshold concepts to structure the research and

EBP curriculum is that the scope of the curriculum might be more clearly defined. A small number of studies indicated that a very broad curriculum may be the norm, particularly for research (Harrison et al., 2005; Irvine et al., 2008). By focusing on threshold concepts, not only are the most critical areas taught, but the curriculum potentially becomes better defined. In its logical conclusion, if agreement on threshold concepts could be reached, then a common set of outcomes for curricula might also be agreed. This may extend to the emphasis on research and / or EBP. Nursing education literature generally acknowledges the link between research and EBP, but the ways that these are each covered in the nursing curricula are not clear. The students in this study were taught both under the umbrella of a single module, though their narratives indicated that they had more exposure to EBP throughout their studies than research. The threshold concepts identified for research and EBP were shown to have links and overlaps and using threshold concepts in teaching would inextricably and overtly link research and EBP, in a way that is not always acknowledged in nursing education literature. Certainly, the students in this study did not always appear to link the two or to see their interdependence.

Another possible solution to the difficulties uncovered in the study, is the timeframe for learning. For research in particular, students felt that the curriculum should have stretched over a much longer period, a finding supported by Ax and Kincade (2001). Along with the recommendation to design the research and EBP curriculum around threshold concepts, the curriculum should include teaching throughout students' undergraduate

studies. Although a specific module of teaching may be desirable and this seems to be common in reported literature, not just in the UK, some of the trouble experienced by students was linked to the short and isolated nature of research and EBP teaching. This meant that students were expected to assimilate a lot of knowledge in a short period of time. A short and single block of research and EBP teaching also seemed to lead to the perception among some students that research specifically was not relevant to nursing.

A third possible direction for curriculum development that was suggested by the findings lies in addressing tacit knowledge, which appeared to be quite widespread in the study. Other threshold concepts literature has focused on the related topic of the hidden curriculum, such as Tsang (2011) and the anticipation is that by addressing tacit knowledge, some of the difficulties associated with learning about research and EBP might be addressed. Anecdotally, several members of academic staff at the school where the study was carried out, have commented on the difficulties of teaching research from a perspective of knowing and understanding and that it is challenging to see research and EBP from a student's perspective. This echoes the discussion by Kneebone (2009) relating to difficulties of teaching from the other side of thresholds. Such comments highlight the possibly unknown or unacknowledged nature of tacit knowledge. This is because educators may fail to grasp that students will not make connections between concepts and knowledge that to the educators seem quite clear. Therefore, linked to using threshold concepts

as a basis for curriculum development, goes a recommendation to identify tacit knowledge and to make sure that this is brought to the surface in the curriculum.

The other major area that needs to be a focus of curriculum development is practice learning. As discussed in chapter 4, there was significant variability in practice learning for research and EBP. The practice area came through very clearly as an important arena for learning about EBP in particular and this is an area that has received attention in other studies, though with mixed results (Florin et al., 2012; Laaksonen et al., 2013; Mattila et al., 2013). It is also an issue that has been raised in official reports and, in the UK, most notably and most recently by the Willis Commission (2012), though this focused on practice learning generally rather than research and EBP specifically.

The students' narratives of their practice experience, with both research and EBP, highlighted that exposure to EBP and research is largely serendipitous and although they all talked about good experiences, they also identified poor experiences. A possible solution may be to introduce objectives for all placements related overtly to EBP most importantly, though including research would be useful. Some studies reported in this thesis found preliminary evidence that project based work in practice related to EBP is helpful for students in learning about research and EBP, as well as in their attitudes towards this (Liou et al., 2013). Though issues such as scalability, working relationships between university and practice

settings and expertise of practice mentors would need to be addressed, consideration should be given to how such projects might be incorporated into the curriculum.

The recommendations in this section are largely concerned with potential for local initiatives, that would best be implemented and tested through engagement of academic staff, researchers and practice mentors. In the next section recommendations are made that would required to be debated in a wider arena as they have significant implications for policy and regulation.

6.3.2 Evidence-based thinking and practising

EBP was identified in chapter 5 as a WTP in nursing and concerns were identified relating to student nurses' assimilation of this into their nursing identity. From the study and evidence about ways of thinking and practising, come recommendations about how evidence-based thinking and practising can be integrated into nursing education. This might contribute to efforts to embed EBP into nursing practice. The key recommendation relates to policy-making and proposes that regulatory bodies should review mandates around nurses being ready for EBP on graduation.

Such a review is needed because the implication from current regulation is that the concepts and skills associated with EBP are taught in undergraduate nursing. This assumes that students entering practice

arrive equipped with basic knowledge and skills associated with EBP. If EBP outcomes for undergraduate nursing education were to be around what Zhang et al. (2012) refer to as “beginning competencies” (p570), then a need to continue developing EBP skills in practice would also be implied, particularly in relation to the implementation and evaluation aspects of EBP. This may be more likely to result over time in ensuring that evidence-based thinking and practising becomes much better embedded in practice.

The other recommendation related to fostering evidence-based thinking and practising in nursing education relates directly to the students’ practice experiences of EBP and research. All the students in this study reported a mix of good and poor EBP in their practice placements. Only one student reported an almost complete EBP cycle (missing the evaluation component), in which he identified a problem, searched for and identified possible solutions and then changed practice, working with a nursing team. Some students talked about how mentors and other nurses were EBP and research-minded and supported them to develop their knowledge and understanding related to EBP specifically.

These narratives could be used as the basis for modelling good practice and the findings suggest that mentors should be better prepared to act as role models and advocates for students, at least in relation to EBP, though ideally for research too. This has implications for mentor preparation, but such a recommendation would help to promote EBP by emphasising its importance both to new nurses and others taking on a mentoring role. It is

also consistent with the recent recommendations of the Willis Commission on Nursing Education (2012), which identified practice education as an area requiring development.

6.4 Recommendations for research

The findings of this study offer potential for a range of future research work based on preliminary evidence that is likely to be of interest across different areas of education. This relates not just to nursing, but also to other healthcare professions and even beyond healthcare to other professions that promote evidence-based approaches to practice. Within these different domains, it would be possible to take a range of approaches, in terms of the research methodologies to use and some of these are noted in the sections below. However, the focus of this section is on those research methodologies that would align with threshold concepts, as this has been a fruitful way to explore challenges in learning associated with research and EBP.

Development of threshold concepts based research has therefore strongly influenced this section, as has the narrative approach. In the study undertaken for this thesis, the combination of threshold concepts theory with narrative research yielded rich and useful insight into problems associated with learning about research and EBP. The potential to extend this has been considered as a focus for future research, without excluding other possible research avenues. The potential for further research has been considered from three perspectives: nursing education; healthcare

education; and professional education (figure 6.1). This approach enables the specific area of nursing education to be examined from the perspective of where future research in research and EBP might be useful, while recognising potential translation and benefit to other areas of professional education, including other healthcare professions.

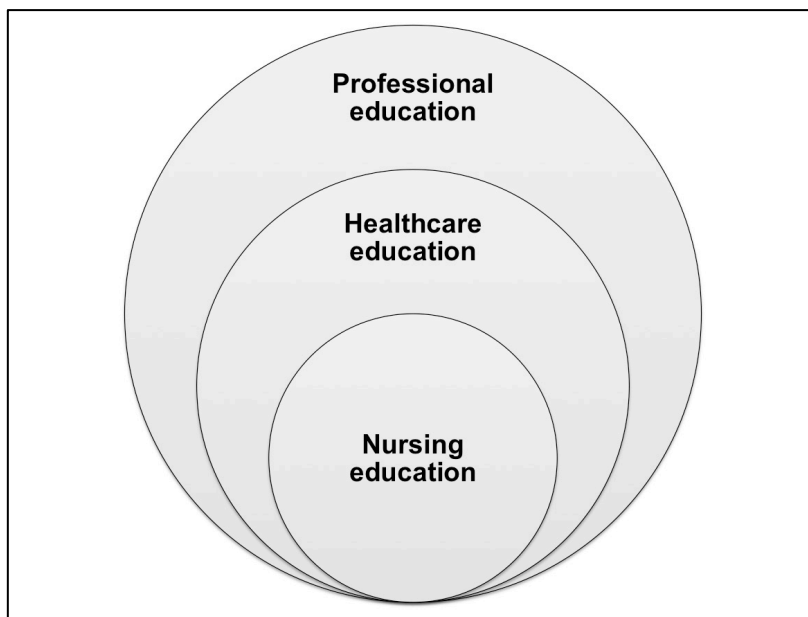


Figure 6.1: Future research domains

6.4.1 Nursing education

While conducting the interviews with student nurses, it was clear that following these students into practice would have been an interesting and potentially useful approach to take, but one that was beyond the scope of the study. However, on reflection, it would also have been useful to follow these students from their entry into nursing education, as well as beyond and into practice. This study just collected narratives from students but the experiences of educators would also be interesting to explore, particularly

their perspectives of teaching EBP from a situation of having already crossed research and EBP thresholds. This could also be done over time, to capture perceptions of changes in students, as well as the different aspects of research and EBP taught through the curriculum.

Longitudinal research like this, over perhaps three to five years, is unusual in education, but it would offer the opportunity to map students' and educators' experiences over the undergraduate programme and beyond. It would also provide detail about students' learning and changes in attitudes, beliefs and identity. Using narrative research to do this could provide detailed data and threshold concepts would enable the research to be focused on specific difficulties of learning, as well as on concepts such as research terminology or critical appraisal that this study has proposed to be thresholds in nature (section 4.6).

Other qualitative approaches might also be appropriate. For example, phenomenography could be a helpful approach, because of its emphasis on individual perceptions and interpretations of experience (Cousin, 2009). This would extend understanding of the effects of attitudes and beliefs that have been identified in this study as influential on how students learn about research and EBP. There may also be benefit in using quantitative tools, such as the knowledge, attitudes and behaviour for EBP scale, developed and validated by Johnston et al. (2003), though the detail and depth of experience provided by qualitative approaches, and particularly in narrative accounts, make these highly useful. This is because they give

insight into the varied reasons for why students experience difficulty and how they resolve this, that quantitative approaches alone are not able to do.

It is also important to bear in mind that this study took place in one specific school of nursing in the UK and so further narrative, thresholds research would be useful to identify how well the findings of this study transfer to other settings. While responses to presentation of the study have been favourable and appear to indicate that nurse educators identify readily with the findings, a stronger evidence base is needed, if the findings are to influence policy and change practice.

Linked to this, this study has identified five threshold concepts in research and EBP education and it would also be useful to test these by introducing them into the curriculum and researching the influence this may have on learning. This could be done using a range of methodologies, both quantitative and qualitative. For example quasi-experimental studies would be helpful in identifying whether a thresholds based curriculum was more effective than a traditional research and / or EBP curriculum, but qualitative research would also be helpful for identifying how students experienced different approaches to research and EBP education. For a larger scale study it would then probably make sense to take a mixed methods approach that would enable the measurement of effectiveness alongside in depth exploration of experiences and perceptions.

6.4.2 Healthcare education

Over the past 10 years, threshold concepts theory has been used across a range of healthcare professions, notably OT, physiotherapy and medicine. EBP is also an important aspect of these disciplines (Thomas, Saroyan, & Dauphinee, 2011) and in chapter 1 the emergence of EBP from medicine into other healthcare professions was laid out. Difficulties with research utilisation across healthcare settings have been identified by Horsley et al. (2011), so extending the focus of this thesis into other healthcare disciplines could be beneficial. This would help to identify whether the problems encountered by nursing students are typical of other healthcare students.

Such research could be carried out through replicating the narrative and threshold research approach in other disciplines. Using narrative would help to identify in detail both similarities and differences between different professional groups. Furthermore, by using thresholds, it would be possible to look into whether the thresholds in research and EBP are identical or similar across professions, or whether different professions have different types of encounters with research and EBP. This approach may be useful because of interest in interprofessional learning in healthcare (Nambiar-Greenwood, 2010) and could help to identify where a discipline specific curriculum is required and where the problems encountered are common across the healthcare professions.

There may also be potential to extend this research agenda into the practice environment, building on the large body of work about barriers to research utilisation, which suggests that the focus for future research should be on solutions to barriers that are well understood (Kajermo et al., 2010). Using threshold concepts as a basis for addressing the educational barriers to research utilisation and undertaking research associated with these, may help to find solutions for helping healthcare professionals to become evidence-based practitioners and to embed EBP within healthcare settings. Using narrative for such research would be useful for understanding individual perspectives. Alternatively, using thresholds in research and EBP alongside quantitative approaches may be beneficial, because of the ability to measure changes in knowledge and attitudes in these groups. There are already validated tools available for measuring different aspects of research and EBP (Funk et al., 1991; Johnston et al., 2003). Equally a more generic tool focused on student learning may be appropriate, such as the Reflections on Learning Inventory™ (Meyer, 2004). Tools like these offer a reliable way to measure the impact of different approaches to research and EBP learning in healthcare, including a threshold concepts based curriculum.

6.4.3 Professional education

There is potential for studying research and EBP education in other professional disciplines. The rationale for this comes from the dissemination of the evidence-based movement to areas such as teaching, social work and social justice and the requirement to equip

students and professionals working in these areas with the requisite skills and understanding. It would be helpful to understand whether the thresholds and trouble experienced by the nursing students in this study are found across disciplines. Instinctively, it seems that there would probably be a significant overlap between professional groups, but differences in curricula, types of students and professionals, as well as different practice settings may mean that there are different research and EBP thresholds encountered or that the nature of trouble is quite different. As with healthcare professions, qualitative approaches would be appropriate and narrative not only offers the ability to explore personal experiences and events in depth, but also aligns particularly well with some of these other professions, such as teaching and social work, where narrative approaches are part of the toolkit of the professions (Grove, 2014).

In developing threshold concepts theory it may be helpful to look at whether, within professional education, there are both professional and academic thresholds. This idea has been put forward in the thesis, as a feature of research and EBP education within nursing and it may be helpful to explore this further in other professions and in other aspects of professional education. This could help to determine how academic study links to professional working and how professional ways of thinking and practising are acquired. In the thresholds literature, identifying and exploring threshold concepts has been the subject of debate (Barradell, 2013), but a collaborative, community approach to identifying thresholds

has been used in different disciplines, such as OT (Rodger & Turpin, 2011), biochemistry (Loertscher, Green, Lewis, Lin, & Minderhout, 2014) and engineering (Knight, Callaghan, Baldock, & Meyer, 2014). Identifying professional and academic thresholds would seem to lend itself well to such a collaborative approach that might involve practitioners, educators, students and researchers. To do this an action research methodology would be useful because of the iterative and participatory nature of such approaches. After an initial identification process, a larger scale quantitative survey may be helpful to validate the proposed thresholds across the wider disciplinary community, because of potential to reach a range of people in diverse settings.

The final area of research proposed relates to the conclusion reached in this study that EBP represents a WTP in nursing. The implications of this for education, policy and for nursing identity have been discussed. This finding and its consequences may be relevant to other disciplines and this is a fertile area for future research, because of the implications for how research and EBP are taught and how they link to professional identity. The starting point would be likely to be a narrative review of the literature, to establish current and popular thinking about EBP as a WTP across professions. Following on from this, narrative research could offer a useful way to research this, because it focuses on individual experiences and is flexible in its interviewing approach, usually enabling participants to express very personalised and reflective stories (Holloway & Freshwater, 2007). Such an approach would be well placed to reveal how, or whether,

EBP is perceived within a profession and as part of professional identity. This may be from the perspective of either students or teachers.

This research study carried out has identified a number of different avenues that could benefit from further research work, notably threshold concepts and troublesome knowledge linked to research and EBP education in particular, as well as the role of EBP as a WTP. These research avenues are not restricted to nursing, extending to the other healthcare professions and to professional education and practice in general. In looking at these opportunities, different methodological approaches could be used, depending on the focus of the study. However, the threshold concepts approach (including the notion of trouble) and narrative research have been shown in this study to be an effective way of investigating topics like this, both individually and together. From a personal perspective, these offer a valuable way to undertake professional educational research, especially in a collaborative context.

6.5 One ending... lots of possibilities

Stories always pose that question: what kind of truth is being told? Stories never resolve that question; their work is to remind us that we have to live with complicated truths.
(Frank, 2010 p10)

Chapter 4 started with the quote from Art Frank above. This quote is as apt for a doctoral thesis as it is for stories, as it is a reminder of the

complexity and "narrated-ness" of the thesis, that tells one particular interpretation of the research journey. This thesis is just that, and is clearly influenced by the times, people, places, choices and interactions during all parts of the study. It is also a "situated truth" that aims to illuminate, explore and interpret students' experiences of research and EBP education. Although the previous section identified a number of areas for further research that might extend understanding and build on the work done in this study, the study was also built on existing evidence from both nursing education and threshold concepts literature, so it can help to inform future curriculum design and development.

Research and EBP are important aspects of undergraduate nursing education and of nursing itself. The difficulties and thresholds associated with them are quite widely acknowledged within the nursing and academic communities, but not well understood. This study has aimed to contribute to understanding of these difficulties and also how students overcome them. It has also aimed to add to a debate on research and EBP within nursing and to point to ways forward to improve the curriculum and propose different approaches to researching this area.

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Appendix 1: Research articles in literature review

Appendix 1: Summary of research articles in literature review

Author(s)	Title	Year	Source	Method	Focus
Arthur & Wong	The effects of the 'learning by proposing to do' approach on Hong Kong nursing students' research orientation, attitude toward research, knowledge, and research skill	2000	Peer reviewed journal	Pre- and post-test	Research
Ax & Kincade	Nursing students' perceptions of research: usefulness, implementation and training	2001	Peer reviewed journal	Qualitative study	Research
Brown, Kim, Stichler & Fields	Predictors of knowledge, attitudes, use and future use of evidence-based practice among baccalaureate nursing students at two universities	2010	Peer reviewed journal	Cross-sectional survey	EBP
Cader, Derbyshire, Smith, Gannon-Leary & Walton	In search of evidence: A small scale study exploring how student nurses accessed information for a health needs assignment	2006	Peer reviewed journal	Qualitative	EBP
Dobratz	Putting the pieces together: Teaching undergraduate research from a theoretical perspective	2003	Peer reviewed journal	Cross-sectional survey	Research
Duggleby	Improving undergraduate nursing research education : The effectiveness of collecting and analyzing oral histories	1998	Peer reviewed journal	Pre- and post-test	Research
Dyson	Research : Promoting positive attitudes through education	1997	Peer reviewed journal	Pre- and post-test	Research
Epstein, Santa Mina, Gaudet, Singh & Gula	Teaching statistics to undergraduate nursing students: An integrative review to inform our pedagogy	2011	Peer reviewed journal	Literature review	Research

Appendix 1: Research articles in literature review (2/4)

Appendix 1: Summary of research articles in literature review (2/4)

Author(s)/Authors	Title	Year	Source	Method	Focus
Florin, Ehrenberg, Wallin & Gustavsson	Educational support for research utilization and capability beliefs regarding evidence-based practice skills : A national survey of senior nursing students	2012	Peer reviewed journal	Cross-sectional survey	EBP
Gray	Research odyssey : The evolution of a research partnership between baccalaureate nursing students and practicing nurses	2010	Peer reviewed journal	Longitudinal mixed methods	Research
Hagen, Awosoga, Kellett & Dei	Evaluation of undergraduate nursing students' attitudes towards statistics courses, before and after a course in applied statistics	2013	Peer reviewed journal	Pre- and post-test	Research
Hagen, Awosoga, Kellett & Damgaard	Fear and loathing: Undergraduate nursing students' experiences of a mandatory course in applied statistics	2013	Peer reviewed journal	Qualitative	Research
Halcomb & Peters	Nursing student feedback on undergraduate research education: Implications for teaching and learning	2009	Peer reviewed journal	Cross-sectional survey	Research
Harrison, Hernandez, Cianelli, Rivera & Urrutia	Perspectives of Latin American nursing professors and leaders about research competencies needed by nurses with different levels of academic preparation	2005	Peer reviewed journal	Cross-sectional survey	Research
Henoch et al.	Nursing students' experiences of involvement in clinical research: An exploratory study	2014	Peer reviewed journal	Cross-sectional survey	Research
Jacobsen & Andenaes	Third year nursing students' understanding of how to find and evaluate information from bibliographic databases and internet sites	2011	Peer reviewed journal	Controlled pre- and post-test	EBP
Kim, Brown, Fields & Stichler	Evidence-based practice-focused interactive teaching strategy: A controlled study	2009	Peer reviewed journal	Controlled pre- and post-test	EBP

Appendix 1: Research articles in literature review (3/4)

Appendix 1: Summary of research articles in literature review (3/4)

Author(s)/Authors	Title	Year	Source	Method	Focus
Laaksonen, Palitta, von Schantz, Ylönen & Soini	Journal club as a method for nurses and nursing students' collaborative learning: A descriptive study	2013	Peer reviewed journal	Cross-sectional survey	EBP
Li, Jin, Jiang & Park	Effects of project-based learning in improving scientific research and practice capacity of nursing undergraduates	2014	Edited book	Pre- and post-test	Research
Liou, Cheng, Tsai & Chang	Innovative strategies for teaching nursing research in Taiwan	2013	Peer reviewed journal	Controlled pre- and post-test	Research
MacVicar	Intellectual development and research: Student nurses' and student midwives' accounts	1998	Peer reviewed journal	Ethnographic study	Research
Mansour & Porter	Educators' experience of teaching nursing research to undergraduates	2008	Peer reviewed journal	Phenomenological study	Research
Mathew & Aktan	Nursing student attitudes toward statistics	2014	Peer reviewed journal	Cross-sectional survey	Research
Mattila & Eriksson	Nursing students learning to utilize nursing research in clinical practice	2007	Peer reviewed journal	Cross-sectional survey	EBP
Mattila, Koivisto & Häggman-Laitila,	Evaluation of learning outcomes in a research process and the utilization of research knowledge from the viewpoint of nursing students	2005	Peer reviewed journal	Cross-sectional survey	Research & EBP
Mattila, Rekola, Koponen & Eriksson	Journal club intervention in promoting evidence-based nursing: Perceptions of nursing students	2013	Peer reviewed journal	Cross-sectional survey	EBP
Moch, Cronje & Branson	Part 1. Undergraduate nursing evidence-based practice education: Envisioning the role of students	2010	Peer reviewed journal	Literature review	EBP

Appendix 1: Research articles in literature review (4/4)

Appendix 1: Summary of research articles in literature review (4/4)

Author(s)/Authors	Title	Year	Source	Method	Focus
Porter	Teaching undergraduate nursing research : A narrative review of evaluation studies and a typology for further research	2001	Peer reviewed journal	Literature review	Research
Porter & Mansour	Teaching nursing research to undergraduates: A text analysis of instructors intentions	2003	Peer reviewed journal	Literature review	Research
Reid-Searl, Dwyer, Jirojwong & Hinton	Research and information literacy at CQU : An explanation of the attitudes of pre-registration and post-registration nursing students	2000	Published conference proceedings	Cross-sectional survey	EBP
Reising	Establishing student competency in qualitative research: Can undergraduate nursing students perform qualitative data analysis?	2003	Peer reviewed journal	Documentary analysis	Research
Roberts & Ousey	Finding and using evidence in academic assignments: The bane of student life	2011	Peer reviewed journal	Cross-sectional survey	EBP
Stokes & Urquhart	Profiling information behaviour of nursing students: part 1: Quantitative findings	2011	Peer reviewed journal	Cross-sectional survey	EBP
Tsai, Cheng, Chang & Liou	Preparing the future nurses for nursing research: A creative teaching strategy for RN-to-BSN students	2014	Peer reviewed journal	Pre- and post-test	Research
Waters, Crisp, Rychetnik & Barratt	The Australian experience of nurses' preparedness for evidence-based practice	2009	Peer reviewed journal	Cross-sectional survey	EBP
Zhang, Zeng, Chen & Li	Assisting undergraduate nursing students to learn evidence-based practice through self-directed learning and workshop strategies during clinical practicum	2012	Peer reviewed journal	Pre- and post-test	EBP

Appendix 2: Literature searches, 1996-2014²⁸

Appendix 2: Literature searches, 1996-2014¹

Literature searches (1/4)

Database	Terms	Results
CINAHL	"Nursing Practice, Evidence-Based" AND "Learning Methods"	104
CINAHL	"Nursing Practice, Evidence-Based" AND "Students, Nursing"	126
CINAHL	"Nursing Practice, Evidence-Based" AND "Teaching Methods"	216
CINAHL	"Research, Nursing" AND "Learning Methods"	106
CINAHL	"Research, Nursing" AND "Students, Nursing"	109
CINAHL	"Research, Nursing" AND "Teaching Methods"	193
Medline	"Education, Nursing" AND "Evidence-Based Practice"	326
Medline	"Nursing Education Research" AND "Education, Nursing"	405
Medline	"Nursing Research" AND "Education, Nursing"	614
ASSIA	Education AND evidence based practice ² AND "teaching OR learning" AND "healthcare OR health care"	14
ASSIA	Education AND evidence based practice AND "teaching OR learning" AND Nursing	24

¹ CINAHL, Medline and Cochrane reviews were searched using controlled vocabularies. ASSIA, Dialog and Zetoc were searched using keywords and phrases in combinations as shown. Some further refinements to narrow searches were made by searching, for example selecting only the abstract for some terms.

² When using key term "evidence based practice", the alternative "evidence-based practice" was always included

Appendix 2: Literature searches, 1996-2014 (2/4)

Literature searches (2/4)

Database	Terms	Results
ASSIA	Education AND research AND "teaching OR learning" AND nursing AND student	314
ASSIA	Education AND research AND "teaching OR learning" AND "healthcare OR health care" AND student	99
Dialog ³	Education AND evidence based practice AND "teaching OR learning" AND "healthcare OR health care"	44
Dialog	Education AND evidence based practice AND "teaching OR learning" AND Nursing	42
Dialog	Education AND research AND "teaching OR learning" AND nursing AND student	66
Dialog	Education AND research AND "teaching OR learning" AND "healthcare OR health care" AND student	43
Cochrane Library	"Education, Nursing"	20
Cochrane Library	"Evidence-based nursing"	11
Cochrane Library	"Nursing education research"	4
Cochrane Library	"Evidence-based practice"	40
<u>Zetoc</u>	Education AND "evidence based practice" AND nursing	37
<u>Zetoc</u>	Education AND "evidence based practice" AND health	27
<u>Zetoc</u>	Education AND health AND learning	121

³ Dialog was a combined search of ERIC, the British Education Index and the Australian Education Index.

Appendix 2: Literature searches, 1996-2014 (3/4)

Literature searches (3/4)

Database	Terms	Results
<u>Zetoc</u>	Education AND health AND teaching	87
<u>Zetoc</u>	Education AND nursing AND teaching	73
<u>Zetoc</u>	Education AND nursing AND learning	86
Total	All searches	3351

Appendix 2: Literature searches, 1996-2014 (4/4)

Research evidence for research and evidence-based practice in undergraduate nursing education

Literature searches (4/4)

Research evidence for research and evidence-based practice in undergraduate nursing education

Filtering / selection process		No of papers after filter applied
Initial searches	3351	3351
Duplicates	831	2520
Remove after review of article titles	1561	959
Remove after review of abstract and / or full paper	923	36

Other related articles found:		Papers found
Research or EBP in undergraduate nursing education: descriptive and evaluation		144
Research or EBP in nursing as part of continuing professional development		92
Research or EBP in nursing as part of postgraduate studies		53
Research or EBP education in other healthcare professions		26

Appendix 3: Participant information sheet and consent form²⁸

Participant Information Sheet

Department of Education

Learning thresholds in research and evidence-based practice: investigating troublesome learning for undergraduate nursing students



Introduction

My name is Linda Martindale and I work as a lecturer in the School of Nursing and Midwifery. I am also a PhD student in the Department of Education at the University of Strathclyde, Glasgow and this information sheet relates to my PhD study.

My main area of teaching is in research skills and most of my teaching is in post-qualifying and postgraduate programmes. I can be contacted at linda.martindale@strath.ac.uk for any information relating to this research study.

What is the purpose of this investigation?

As you may already know, the Nursing and Midwifery Council (NMC) stipulates that nurses and midwives must “use the best available evidence” (NMC, 2008). Because of this it is important for student nurses to develop a good understanding of research and evidence-based practice, to prepare you for clinical practice. However there is research evidence which suggests that students find research a difficult topic.

This study aims to explore and examine nursing students’ learning of research and evidence-based practice, focusing particularly on aspects which are difficult. It is also investigating how students overcome these difficulties. It is hoped that through understanding the learner perspective more clearly, strategies can be devised to help students’ learning in research and evidence-based practice.

The study sample is being taken from all third year nursing students taking the Introduction to Health-related Research and Evidence-based Practice module in Semesters 1 and 2 2011-2012.

Do you have to take part?

Participating in this study is voluntary and will not affect your studies in any way at all.

²⁸ All identifying references to the study site in this appendix have been anonymised using “xxx”

You will be asked to give your written consent to take part and to have the interview recorded. All the information you give will be kept confidential. You can leave the study at any time and this will not affect your studies in any way.

What will you do in the project?

If you decide to take part you will be invited to two interviews, one before you start the module and one at the end. You will also get the opportunity to look at the written transcripts of the interviews and make any comments you wish. Even if you do not complete the module for any reason, you can still take part in both interviews.

The interviews will last approximately 45 mins – 1 hr and I will be the research interviewer. I will record the interviews and you will be asked to talk freely and in-depth about your experience learning about research and evidence-based practice. Although there are some specific aspects of your study, which I would like to hear about, the interview will be unstructured, giving you the opportunity to talk about issues, events and experiences which you feel are important. Before each interview I will explain more about the purpose of the interview and what we will talk about.

Why have you been invited to take part?

All pre-registration nursing students undertaking the year three module *Introduction to Health-related Research and Evidence-based Practice* are eligible to participate and a random sample has been selected, which includes students from adult, child and mental health branches.

What are the potential risks to you in taking part?

There are no risks associated with this research and your studies will not be affected in any way by participating in this research, or if you decide not to take part.

What happens to the information in the project?

Everything you say in the interviews will be kept confidential - the only people with access to these will be myself and my supervisors, none of whom are in the School of Nursing and Midwifery. The module leader will know that you are participating, but will not have access to the data. If you wish, your personal tutor may also be told that you are participating. This is so that you can discuss any concerns or issues arising from the interviews with him / her. However you will be asked for permission to let your personal tutor know you are taking part.

Once the interview is complete two copies of the recordings and transcripts of the recordings will be kept in secure and password-protected areas, in the University of xxx.

The University of Strathclyde is registered with the Information Commissioner's Office who implements the Data Protection Act 1998. All personal data on participants will be processed in accordance with the provisions of the Data Protection Act 1998.

Thank you for reading this information – please ask any questions if you are unsure about what is written here.

What happens next?

If you are happy to take part in the research study, you will be asked for written consent prior to the interview. I will contact you to arrange a time and place for the first interview. The interviews will take place on campus, either at xxx or at the xxx Campus, according to your preference.

If you have decided not to take part, I would like to thank you for considering this and wish you well in your studies.

The results of the study will be written up and presented for a PhD degree and it is also anticipated that they will be published as journal articles.

This investigation was granted ethical approval by the University of Strathclyde ethics committee.

If you have any questions/concerns, during or after the investigation, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

Dr Christine Sinclair
Centre for Academic Practice and Learning Enhancement
University of Strathclyde
Graham Hills Building
50 George Street
Glasgow
G1 1QE

Telephone: 0141 548 4062
Email: christine.sinclair@strath.ac.uk

Researcher Contact Details:

Linda Martindale
Lecturer
School of Nursing and Midwifery
University of xxx

Tel: xxx
Email: linda.martindale@strath.ac.uk

Chief Investigator Details (1st Supervisor):

Prof. Ray land
Director, CAPLE
University of Strathclyde
Level 2 Graham Hills Building
50 George St.
Glasgow G1 1QE

Tel: 0141 548 4064
Email: ray.land@strath.ac.uk

Participant Information Sheet (2)²⁹

Department of Education

Learning thresholds in research and evidence-based practice: investigating troublesome learning for undergraduate nursing students



Supplementary participant information: access to unmarked assessment work

Introduction

Your participation in the interviews related to the study *Learning thresholds in research and evidence-based practice: investigating troublesome learning for undergraduate nursing students* was greatly appreciated. Now that your assignment work has been marked, graded and returned to you, I would like to ask your permission to use your assignment work in the research study, alongside the data from the interviews.

I will only use this if you give permission and would only access the unmarked script. I will not know how your work was graded or see any of the markers' comments.

Do you have to take part in this part of the project?

Participating in this part of the study is voluntary and will not affect your studies in any way at all.

You will be asked to give written consent to allow me access to the assignment. All the information accessed will be kept confidential. You can withdraw consent at any time and this will not affect your studies in any way.

What will you do?

If you decide to allow me to use your assignment work as part of the data, you will be asked to give written consent, in the same way as you consented to take part in the interviews. You will not need to do anything else – I will request a copy of the unmarked assignment from the School of Nursing and Midwifery and will provide the School with proof of your written consent.

Why have you been invited to take part?

You have been asked to take part in this additional part of the study because you have already been interviewed.

What are the potential risks to you in taking part?

There are no risks associated with this and your studies will not be affected in any way by giving consent for me to access your assignment work, or if you decide not to allow access.

²⁹ Supplementary ethical approval included permission to collect the student assessments, as additional data. This form and consent form 2 (see below) relate to this data. Twelve students contributed assessment data, but this data has not been included in the thesis, though it will be analysed in due course.

What happens to the information in the project?

Everything you have written in your assignment will be kept confidential - the only people with access to the work will be myself and my supervisors, none of whom are in the School of Nursing and Midwifery.

A copy of your unmarked assignment will be kept in secure and password-protected areas, in the University of xxx.

The University of Strathclyde is registered with the Information Commissioner's Office who implements the Data Protection Act 1998. All personal data on participants will be processed in accordance with the provisions of the Data Protection Act 1998.

Thank you for reading this information – please ask any questions if you are unsure about what is written here.

What happens next?

If you are happy to take part in the research study, you will be asked for written consent prior to the interview. I will contact you to arrange a time and place for the first interview. The interviews will take place on campus, either at xxx or at the xxx Campus, according to your preference.

If you have decided not to take part, I would like to thank you for considering this and wish you well in your studies.

This investigation was granted ethical approval by the University of Strathclyde ethics committee.

If you have any questions/concerns, during or after the investigation, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:

Dr Christine Sinclair
Centre for Academic Practice and Learning Enhancement
University of Strathclyde
Graham Hills Building
50 George Street
Glasgow
G1 1QE

Telephone: 0141 548 4062
Email: christine.sinclair@strath.ac.uk

Researcher Contact Details:

Linda Martindale
Lecturer
School of Nursing and Midwifery
University of xxx

Tel: xxx

Email: linda.martindale@strath.ac.uk

Chief Investigator Details (1st Supervisor):

Prof. Ray land
Director, CAPLE
University of Strathclyde
Level 2 Graham Hills Building
50 George St.
Glasgow G1 1QE

Tel: 0141 548 4064

Email: ray.land@strath.ac.uk

Consent Form (1)



Department of Education

Learning thresholds in research and evidence-based practice: investigating troublesome learning for undergraduate nursing students

Participating in this study is voluntary: if you do not wish to participate, or decide to withdraw from the study before it is finished, this will not affect your studies in any way.

- I confirm that I have read and understood the information sheet for the above project and the researcher has answered any queries to my satisfaction.
- I understand that my participation is voluntary and that I am free to withdraw from the project at any time, without having to give a reason and without any consequences.
- I understand that I can withdraw my data from the study at any time.
- I understand that any information recorded in the investigation will remain confidential and no information that identifies me will be made publicly available.
- I consent to being a participant in the project
- I consent to being audio recorded as part of the project

I, (PRINT NAME)	Hereby agree to take part in the above project
Signature of Participant:	Date

Consent Form (2)



Department of Education

Learning thresholds in research and evidence-based practice: investigating troublesome learning for undergraduate nursing students

Supplementary consent form to access unmarked assessment work

Participating in this aspect of the study is voluntary: if you do not wish to give permission for access to your unmarked assessment work, or decide to withdraw this permission at a later date, this will not affect your studies in any way.

- I confirm that I have read and understood the information sheet for this aspect of the study and the researcher has answered any queries to my satisfaction.
- I understand that my participation is voluntary and that I am free to withdraw from the project at any time, without having to give a reason and without any consequences.
- I understand that I can withdraw my data from the study at any time.
- I understand that any assessment work included as data in the project will remain confidential and no information that identifies me will be made publicly available.
- I consent to my unmarked assessment work for the module being used as data in the project

I, (PRINT NAME)	Hereby agree to take part in the above project
Signature of Participant:	Date

Appendix 4: Schedule of potential questions - Interview 1

Appendix 4: Schedule of potential questions - Interview 1

Preliminary information	Introduction: <ul style="list-style-type: none"> • Welcome and thanks for participating • Questions about study • Consent • Format of interview 	
	Orientation: <ul style="list-style-type: none"> • Education / jobs before nursing • Reasons for studying nursing • Understanding of research and EBP 	Research experiences: <ul style="list-style-type: none"> • Learning and experiences to date - in university or education settings; in practice placements • Feelings about research
Main part of interview (no set order for discussion points after orientation questions)	Evidence-based practice experiences: <ul style="list-style-type: none"> • learning and experiences to date - in university or education settings; in practice placements • feelings about EBP • place of EBP in nursing 	Practice placements: <ul style="list-style-type: none"> • Examples of EBP in practice • Examples of lack of EBP in practice • Mentors and other nurses' and EBP – knowledge, attitudes, behaviours
	Module: <ul style="list-style-type: none"> • Reasons for taking module • Feelings about doing module • Plans for managing study of module • Challenging aspects of module 	Moving on into nursing: <ul style="list-style-type: none"> • EBP and being a nurse • Research and being a nurse • Feelings about preparedness for EBP • Research as a career
Close	Conclusion: <ul style="list-style-type: none"> • Any other information • Thanks and arrangements for second interview 	

Appendix 5: Schedule of potential questions - Interview 2

Appendix 5: Schedule of potential questions - Interview 2

Preliminary information	Introduction: <ul style="list-style-type: none"> • Welcome and thanks for coming back for interview 2 • Reminder of no new requirement for consent – verbal confirmation • Format of interview 	
	Orientation: <ul style="list-style-type: none"> • Generally how the module went 	Terminology and discourse: <ul style="list-style-type: none"> • Language of research and EBP • Volume / difficulty of research language • Comparison with nursing terms
Main part of interview (no set order for discussion points after orientation question)	Module learning and teaching: <ul style="list-style-type: none"> • Difficulty: parts of module and overall • Changes in understanding • Module content and reading materials • Online learning • Support for learning (peer / tutor) 	Assignment work: <ul style="list-style-type: none"> • Choice of paper to critique • Discussion of paper • Approach to completing assignment • The ten focussed questions • Critical appraisal
	Research: <ul style="list-style-type: none"> • Attitudes and feelings about research • Perceived understanding of research now • Feelings about doing research as a nurse 	EBP: <ul style="list-style-type: none"> • Attitudes and feelings about EBP • Perceived understanding of EBP now • Feelings about use of evidence in practice
Close	Conclusion: <ul style="list-style-type: none"> • Any other information • Thanks for participation 	

Appendix 6: Ethics application and approval confirmation³⁰



Linda Martindale
School of Nursing and Midwifery

16 May 2011

Dear Linda

This is to confirm my email message of 28 March 2011 that I am now happy to take Chair's Action for our Departmental Ethics Committee and sign off your amended and augmented Ethics Form for your PhD Study "Learning thresholds in research and evidence-based practice: investigating troublesome learning for undergraduate nursing students".

I wish you every success with this research.

Yours sincerely

A handwritten signature in cursive script that reads "Christine Sinclair".

Dr Christine Sinclair
Lecturer

Centre for Academic Practice
& Learning Enhancement
Graham Hills Building
50 George Street
Glasgow G1 1QE

T: 0141 548 2637
F: 0141 553 2053

Director:
Professor Ray Land
MA MSc PhD FRSA FSEDA



³⁰ All identifying references to people and the study site, in this appendix and appendix 7, have been blanked out

Appendix 7: Second ethics approval confirmation

School of Psychology

University of Strathclyde Research Ethics Committee

Linda Martindale,
Lecturer,
School of Nursing and Midwifery,
University of Strathclyde,
Glasgow, Scotland

24 June 2011

Dear Ms Martindale,

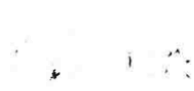
Thank you for providing a copy of the approval letter from the University of Strathclyde Ethics Committee for your research project, 'Learning thresholds in research and evidence-based practice: investigating troublesome learning for undergraduate nursing students'.

I am pleased to confirm that the University of Strathclyde REC has given reciprocal approval for this project.

This decision is based on the following documents you provided:

1. Ethics
2. Covering letter Mar 2011
3. Ethics Form Linda Martindale v2 Feb 2011
4. Participant Info Sheet & Consent form Linda Martindale v2 Feb 2011

Yours sincerely,



Chair, University of Strathclyde Research Ethics Committee

Digitally signed by
DN: c=UK,
ou=Strathclyde,
email=,
c=GB
Reason: I am the author of this document
Date: 2011.06.24 12:04:23 +01'00'

College of Art and Social Sciences UNIVERSITY OF STRATHCLYDE

Appendix 8: Approval for access to staff and students³¹

REF:APPS/11/11 –LP/GW

Mrs Linda Martindale
School of Nursing and Midwifery
University of xxx
xxx
xxx

14 September 2011

Dear Mrs Martindale,

ACCESS TO STAFF/STUDENTS FOR RESEARCH PURPOSE

Title of Research: *Learning thresholds in research and evidence-based practice: investigating troublesome learning for undergraduate nursing students.*

Thank you for your application for access which has been considered carefully.

I am pleased to advise you that access for your study has been approved.

Please contact programme lead xxx or xxx should you require any further assistance

Kindly submit a final report of your research study within three months of completion.

Good luck with your research.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Linda Martindale', is written over a horizontal line.

Dr xxx
Senior Lecturer

³¹ All identifying references to the study site in this appendix have been anonymised using “xxx”

Appendix 9: Data analysis: codes, meaning groups and themes

Codes (final)³²

1. Variability experienced in EBP in practice placements
2. Research is a difficult topic
3. Facets about terminology or language of research / EBP
4. Facets of EBP in the curriculum
5. Facets of research in the curriculum
6. Facets of critiquing skills
7. Experience of research studies in practice placements
8. Facets of statistics and numbers
9. Troublesome research knowledge encounters
10. Differences in EBP between healthcare specialties / departments
11. Conceptions of EBP or research and between EBP and research
12. Positive role-model(s) for research or EBP
13. Information skills teaching
14. Information skills use or understanding
15. Experience of meaningful learning about EBP in practice placements
16. Variability experienced in mentor support in practice placements
17. Positive encounters of EBP in practice placements
18. EBP should be used more in healthcare settings
19. Facets of challenging poor practice
20. Aspects of doing research in the future as a nurse
21. Aspects of using evidence in the future as a nurse
22. Expressions of confidence related to finding / using evidence
23. Facets of time for doing the module work
24. Facets of balancing the module work with other aspects of life
25. Facets of planning study / learning in the module
26. Facets of managing online learning
27. Experiences of research before entering nursing study
28. Experiences of poor attitudes of nurses towards EBP
29. Lack of evidence use in healthcare settings
30. Experiences of poor attitudes towards EBP in NHS
31. Facets of becoming a nurse
32. Facets of peer and teacher support for research and EBP learning
33. Facets of mentors' and other nurses' subject knowledge
34. Facets of mentors' and other nurses' research-mindedness

³² Codes 1-51 were devised for interview 1 and also used in interview 2. Codes 52-103 were only applied to interview 2.

Appendix 9: Data analysis: codes, meaning groups and themes (2/3)

Codes (final)

35. Currency of knowledge and expertise of University teaching staff
36. Facets of the theory practice gap
37. Facets of approaches to learning and teaching in the module
38. Facets of the approach to assessment in the module
39. Positive attitudes of students to research
40. Attitudes of older nurses towards research and EBP
41. Belief that EBP is for more senior nurses
42. Aspects of choosing which article to critique
43. Expectations of what the module will be like
44. Difficulties related to being a student on a placement
45. Qualitative research is more aligned to nursing and caring than quantitative
46. Facets of the role of leadership relating to research & EBP in practice
47. Scepticism and doubt about the value of research
48. Beliefs about the student's own personal learning style
49. Facets of nursing identity
50. Stories of deciding to study nursing
51. Stories of work, life and study before nursing
52. Support from teaching staff during the module
53. Peer and informal support during the module
54. Facets of learning from the module learning units
55. Facets of approaches to studying and doing the assignment
56. Students' attitudes to online learning
57. Facets of use of textbooks during the module
58. Facets of use of journal articles during the module
59. Positive experiences of discussion boards in the module
60. No or very little use of discussion boards in the module
61. Approaches to finding definitions for research terminology
62. Difficulty related to research terminology
63. Specific research terms that are difficult
64. Comparisons of research and nursing terminology
65. Demonstrations of a growing research understanding
66. Demonstrations of a growing EBP understanding
67. Expressions of any negative feelings related to research / EBP
68. Module / research is relevant to practice or further study
69. Facets of changes in way of thinking about research / EBP
70. Facets of changes in way literature is used in assignments
71. Module / assignment has no relevance to practice
72. Awareness of limits to student's own research understanding
73. Demonstrations of confident and advancing use of research discourse
74. Tentative or wrong use of research discourse
75. Research terminology is a barrier to understanding research and literature

Appendix 9: Data analysis: codes, meaning groups and themes (3/3)

Codes (final)

- 76. Difficulty relating to critiquing literature
- 77. Uncertainty about level of research understanding and result of assignment
- 78. Discomfort with reading or critiquing quantitative research
- 79. Discomfort with reading or critiquing qualitative research
- 80. Facets of the assignment's guiding questions
- 81. Aspects of essay student judged went well
- 82. Aspects of essay student judged went poorly
- 83. Usefulness of using critique frameworks to analyse articles
- 84. Expressions of confidence in critiquing articles in future
- 85. Usefulness of critiquing skills for future academic or practice work
- 86. Different attitudes of student towards quantitative and qualitative research
- 87. Facets of developing skills of self direction in study
- 88. Perceptions of other students' experiences / attitudes to research or the module
- 89. Learning from the module will be useful for other essays
- 90. Learning from the module will not be useful for other essays
- 91. Expressions of the student's position relative to a researcher
- 92. Expressions of enjoyment of research or being glad to have studied the module
- 93. Demonstration of understanding the complexity of research process
- 94. Student discussed specific aspects of paper
- 95. Expressions of module being good or straightforward
- 96. Student directly describes a liminal or tentative state
- 97. Expressions of a lack of interest or dislike of the module
- 98. Critiqued the quantitative paper
- 99. Critiqued the qualitative paper
- 100. Referred to being part of my research study
- 101. Student has not entered a liminal state
- 102. Expressions of actively avoiding working with other students
- 103. Expressions of finding no difficulty in doing module

Meaning groups:

Development of 15 meaning groups from codes (n=103)

Special codes³³

- #27 Experiences of research before entering nursing study
- #50 Stories of deciding to study nursing
- #51 Stories of work, life and study before nursing
- #98 Critiqued the quantitative paper
- #99 Critiqued the qualitative paper
- #100 Referred to being part of my research study

Terminology and discourse of research

- #03 Facets about terminology or language of research / EBP
- #11 Conceptions of EBP or research and between EBP and research
- #61 Approaches to finding definitions for research terminology
- #62 Difficulty related to research terminology
- #63 Specific research terms that are difficult
- #64 Comparisons of research and nursing terminology
- #73 Demonstrations of confident and advancing use of research discourse
- #74 Tentative or wrong use of research discourse
- #75 Research terminology is a barrier to understanding research and literature
- #94 Student discussed specific aspects of paper

Ways of studying and doing assignment work in the module

- #23 Facets of time for doing the module work
- #24 Facets of balancing the module work with other aspects of life
- #25 Facets of planning study / learning in the module
- #26 Facets of managing online learning
- #32 Facets of peer and teacher support for research and EBP learning
- #37 Facets of approaches to learning and teaching in the module
- #38 Facets of the approach to assessment in the module
- #42 Aspects of choosing which article to critique
- #43 Expectations of what the module will be like
- #52 Support from teaching staff during the module
- #53 Peer and informal support during the module
- #54 Facets of learning from the module learning units
- #55 Facets of approaches to studying and doing the assignment
- #56 Students' attitudes to online learning

³³ These are codes that included important supplementary or background information for the analysis.

Meaning groups (2/4):

Ways of studying and doing assignment work in the module (cont)

- #57 Facets of use of textbooks during the module
- #58 Facets of use of journal articles during the module
- #59 Positive experiences of discussion boards in the module
- #60 No or very little use of discussion boards in the module
- #80 Facets of the assignment's guiding questions
- #102 Expressions of actively avoiding working with other students
- #103 Expressions of finding no difficulty in doing module

General perceptions of research related to learning

- #05 Facets of research in the curriculum
- #45 Qualitative research is more aligned to nursing and caring than quantitative
- #72 Awareness of limits to student's own research understanding
- #81 Aspects of essay student judged went well
- #82 Aspects of essay student judged went poorly
- #86 Different attitudes of student towards quantitative and qualitative research
- #88 Perceptions of other students' experiences / attitudes to research or the module
- #91 Expressions of the student's position relative to a researcher

Experiences of the nursing curriculum

- #04 Facets of EBP in the curriculum
- #05 Facets of research in the curriculum
- #32 Facets of peer and teacher support for research and EBP learning
- #35 Currency of knowledge and expertise of University teaching staff
- #36 Facets of the theory practice gap
- #48 Beliefs about the student's own personal learning style
- #87 Facets of developing skills of self direction in study

Troublesome research knowledge

- #02 Research is a difficult topic
- #09 Troublesome research knowledge encounters
- #11 Conceptions of EBP or research and between EBP and research
- #47 Scepticism and doubt about the value of research
- #67 Expressions of any negative feelings related to research / EBP
- #77 Uncertainty about level of research understanding and result of assignment
- #78 Discomfort with reading or critiquing quantitative research
- #79 Discomfort with reading or critiquing qualitative research
- #96 Student directly describes a liminal or tentative state

Meaning groups (3/4):

Module's relevance to other nursing study or practice

- #68 Module / research is relevant to practice or further study
- #84 Expressions of confidence in critiquing articles in future
- #85 Usefulness of critiquing skills for future academic or practice work
- #89 Learning from the module will be useful for other essays

Skills related to research and EBP

- #06 Facets of critiquing skills
- #08 Facets of statistics and numbers
- #13 Information skills teaching
- #14 Information skills use or understanding
- #22 Expressions of confidence related to finding / using evidence
- #76 Difficulty relating to critiquing literature
- #83 Usefulness of using critique frameworks to analyse articles
- #84 Expressions of confidence in critiquing articles in future
- #85 Usefulness of critiquing skills for future academic or practice work

Development in research understanding and transformation

- #65 Demonstrations of a growing research understanding
- #66 Demonstrations of a growing EBP understanding
- #69 Facets of changes in way of thinking about research / EBP
- #70 Facets of changes in way literature is used in assignments
- #73 Demonstrations of confident and advancing use of research discourse
- #93 Demonstration of understanding the complexity of research process

Negative attitudes about research

- #47 Scepticism and doubt about the value of research
- #67 Expressions of any negative feelings related to research / EBP
- #71 Module / assignment has no relevance to practice
- #90 Learning from the module will not be useful for other essays
- #97 Expressions of a lack of interest or dislike of the module

Positive attitudes about research

- #39 Positive attitudes of students to research
- #92 Expressions of enjoyment of research or being glad to have studied the module
- #95 Expressions of module being good or straightforward

Meaning groups (4/4):

Becoming a nurse

- #20 Aspects of doing research in the future as a nurse
- #21 Aspects of using evidence in the future as a nurse
- #31 Facets of becoming a nurse
- #49 Facets of nursing identity

Students' perceptions of nurses in relation to research and EBP

- #10 Differences in EBP between healthcare specialties / departments
- #12 Positive role-model(s) for research or EBP
- #16 Variability experienced in mentor support in practice placements
- #28 Experiences of poor attitudes of nurses towards EBP
- #33 Facets of mentors' and other nurses' subject knowledge
- #34 Facets of mentors' and other nurses' research-mindedness
- #40 Attitudes of older nurses towards research and EBP
- #41 Belief that EBP is for more senior nurses
- #46 Facets of the role of leadership relating to research & EBP in practice

Variability encountered related to EBP

- #01 Variability experienced in EBP in practice placements
- #07 Experience of research studies in practice placements
- #10 Differences in EBP between healthcare specialties / departments
- #16 Variability experienced in mentor support in practice placements

Troublesome EBP experiences

- #18 EBP should be used more in healthcare settings
- #19 Facets of challenging poor practice
- #28 Experiences of poor attitudes of nurses towards EBP
- #29 Lack of evidence use in healthcare settings
- #30 Experiences of poor attitudes towards EBP in NHS
- #36 Facets of the theory practice gap
- #40 Attitudes of older nurses towards research and EBP
- #41 Belief that EBP is for more senior nurses
- #44 Difficulties related to being a student on a placement
- #101 Student has not entered a liminal state

Positive EBP experiences

- #12 Positive role-model(s) for research or EBP
- #15 Experience of meaningful learning about EBP in practice placements
- #17 Positive encounters of EBP in practice placements

Development of themes (1/2)

Development of themes (1/2)

Related meaning groups ³⁸	
Theme	
<p><u>1. Variability and complexity in learning</u></p> <p>Students experienced a wide variety of EBP and to a lesser extent research. Students reacted differently to those experiences, particularly the negative ones.</p> <p>There was a lot of variability and complexity in the way students studied, learned, approached assignment work etc.</p>	<ul style="list-style-type: none"> • Variability encountered related to EBP • Troublesome EBP experiences • Positive EBP experiences • Ways of studying and doing assignment work in the module
<p><u>2. Diverse sources of trouble</u></p> <p>Students encountered difficulty, trouble and challenges from a range of sources, which were internal and external.</p>	<ul style="list-style-type: none"> • Troublesome EBP experiences • Troublesome research knowledge • Terminology and discourse of research • Experiences of the nursing curriculum • Negative attitudes about research

³⁸ Three of the meaning groups occur in two themes and all others only map to one theme.

Development of themes (2/2)

Development of Themes (2/2)

Theme	Related meaning groups
<p><u>3. Degrees of academic and professional transformation</u></p> <p>Particularly in the second interview many students talked directly about change, development and growth. Different degrees of transformation were identified.</p>	<ul style="list-style-type: none"> • Module's relevance to other nursing study or practice • Development in research understanding and transformation • Positive attitudes about research
<p><u>4. Research and evidence-based practice in becoming a nurse</u></p> <p>Students talked about a range of attitudes, knowledge and actions among practising nurses, including their reactions to this. They considered their own future roles as nurses and nursing identity as part of the community of nursing practice.</p>	<ul style="list-style-type: none"> • Becoming a nurse • Student perceptions of nurses in relation to research and EBP
<p><u>5. Academic and professional thresholds</u></p> <p>Different types of thresholds were identified, notably academic thresholds, thresholds connecting research and EBP to practice, and thresholds related to becoming a nurse</p>	<ul style="list-style-type: none"> • Terminology and discourse of research • General perceptions of research related to learning • Skills related to research and EBP • Becoming a nurse

Appendix 10: Codes linked to trouble

Appendix 10: Codes linked to trouble

Code	Student quote
#02 Research is a difficult topic	I think like I actually found the module quite hard, personally myself, because well it was for your degree so it was obviously going to be a bit harder, but just try to understand it and get your head around the research, the different types of research. (Jess)
#03 Facets about terminology or language of research / EBP	I think the, the jargon was quite difficult to get your head round, like what's research governance and em, what was the other one, eh, reliable, what was it called again. (Shannon)
#04 Facets of EBP in the curriculum	LM: and have you had it explained to you how you go about finding the evidence and how you use it? Fran: probably. Sorry it doesn't help, does it? Probably, I probably have been but... LM: ...you can't recall? Fran: no
#05 Facets of research in the curriculum	Just kind of went through all your research you can go through. Quantitative, qualitative all that kind of carry on, which has been great I think. I don't really know. (Mandy)
#09 Troublesome research knowledge encounters	But at the moment it's a case of just got past the first week, I'm half way through the second week and it's still a lot of foginess with a lot of the stuff that I'm reading. Some of the stuff that we're told to read it's a case of why are we reading that. It doesn't, it doesn't make sense at all. (Sandy)

Appendix 10: Codes linked to trouble (2/7)

Appendix 10: Codes linked to trouble (2/7)

Code	Student quote
#11 Conceptions of EBP or research and between EBP and research	I think I differ them in that research is what's done. Let me take a subject just, what was I doing. Oh em I was reading something on injections, so if someone was to do a research paper or a research study on intramuscular injections I kind of see that as what, what leads to the evidence-based practice. Does that make sense? (Caitlin)
#18 EBP should be used more in healthcare settings	Well yes because now I'll know if I see something that's not working well and it's just being done I will now think to myself. Why is that being done. I could go and check and see, if it is evidence-based. (Lisa)
#19 Facets of challenging poor practice	And a lot of the time when I ask nurses why are you doing that, they haven't said it's because this says... But I don't think I would ever go back and question a whole ward and say, that's not right. I don't think I would have the guts to do that. (Lisa)
#28 Experiences of poor attitudes of nurses towards EBP	Em, they're [some nurses] stuck in their ways, they don't pick up the magazines, they're more interested in just, we'll care for them, that's a doctor's job. We don't get paid to do... that's what they kind of see, they won't look at the research. And then when you question them to say, well this is what we've been shown, they'll just go, well this is the way I do it and that's it. (Sandy)
#29 Lack of evidence use in healthcare settings	...but I don't hear a lot of people on placement or anything in practice, people sort of saying, you know, this is evidence-based and research has informed this. You know I don't hear that an awful lot in clinical practice. (Kayleigh)

Appendix 10: Codes linked to trouble (3/7)

Appendix 10: Codes linked to trouble (3/7)

Code	Student quote
#30 Experiences of poor attitudes towards EBP in NHS	...still this negative attitude [to EBP] within the hospital wards and in healthcare that, you know, there's still this big divide. Not sure, there would have to be a big attitude change I think within the NHS for that to help. (Louise)
#32 Facets of peer and teacher support for research and EBP learning	There are discussion boards on, but sometimes you're never really sure what's being discussed anyway, so it doesn't really help. (Abby)
#35 Currency of knowledge and expertise of University teaching staff	I think the lecturers need to be in touch with what's going on and I think a lot of lecturers are not in touch with what's going on in the wards. They've been out of practice for so long, they've got no idea as to what is actually going on, you know. (Louise)
#36 Facets of the theory practice gap	...that's the think I don't get. When I'm reading this I'm thinking like I can see why some of this relates but not all of it. (Chrissie)
#40 Attitudes of older nurses towards research and EBP	They've [some older nurses] never moved to a different ward or they've been there from they qualified and they're not going to go anywhere else. They don't want to move up, they don't want to take any more responsibility. I always find they lack and keeping up with their practice and their reading. (Chrissie)

Appendix 10: Codes linked to trouble (4/7)

Appendix 10: Codes linked to trouble (4/7)

Code	Student quote
#41 Belief that EBP is for more senior nurses	I think, yeah I think, I think a lot of people would think oh that's for a nurse practitioner or, or the charge nurse who's gonna implement these things. That's not for me to know. (Mandy)
#44 Difficulties related to being a student on a placement	...so I do find it's quite confusing sometimes, as well cos one person's telling you do something and you see somebody doing it another way and I find it's quite confusing then you're a student you go and say well I've been taught or when you're reading about that this is the way to do it. I find it's quite. "You're ? Who does she think she is" and that and you think hmm. (Liz)
#47 Scepticism and doubt about the value of research	And it's not only that, qualitative research was really not admired. It was something that was dismissed completely out of hand by everybody that I worked with when I was a student. And so, nursing is a much ore qualitative discipline. And I think that's something that I need to learn more about. I don't know anything about qualitative research at all. (Sarah)
#48 Beliefs about the student's own personal learning style	I felt it was the online nature of it that got to me. Didn't seem to have the same support you do in, as a group, when you're actually coming in and doing the, the stuff, tend to knock ideas back and forward... I thought if they'd been sort of some kind of, like a wee pop quiz at the end and you had to get a pass on that before you could get the next... (Stuart)

Appendix 10: Codes linked to trouble (5/7)

Appendix 10: Codes linked to trouble (5/7)

Code	Student quote
#61 Approaches to finding definitions for research terminology	I think that was the biggest hurdle for me, was the terminology. I think you could quite easily write, you could easily critique it but then you wouldn't have the terminology in it, when you have to put the terminology in it that things get confused. (Sam)
#62 Difficulty related to research terminology	...the chi – is it chi squared test, I did not get that at all. Confidence intervals, they were a mystery. And we tried to find books and we tried to find articles explaining them and we found one that explained confidence intervals but the article was more complicated than anything I've ever read. We just, we couldn't process the information. (Caitlin)
#63 Specific research terms that are difficult	Well I think the, like, I tried not to get too hung up on them because if I could see what they were meaning like the p value, that, like, I think it was how em [pause] what's the word appropriate the result is, like how not reliable, can't think of the word. (Sally)
#64 Comparisons of research and nursing terminology	I think that the terms that we use of the wards, cos you do start using them and by now we are using them on the wards. I think they're things that you can associate with body processes and people and and they mean more because of that... But the research language, they're [nursing students] not using that on a daily basis and they're not using it associated with things they can see, understand. I'm not saying people aren't taking on board the language and understanding it but I think it is drier. (Sarah)
#67 Expressions of any negative feelings related to research / EBP	I hated it. I really...Ended up in a complete mess. (Stuart)

Appendix 10: Codes linked to trouble (6/7)

Appendix 10: Codes linked to trouble (6/7)

Code	Student quote
#71 Module / assignment has no relevance to practice	...it [the assignment paper] was outdated. It was, like she done her research whatever, took her a couple of years. Think it was 2004. Took her maybe two years or four years and then it wasn't printed to 2010 and we're now in 2012 and as a student nurse it doesn't teach me anything cos it's stuff I already knew and I can see the changes have already been made. (Ruth)
#74 Tentative or wrong use of research discourse	...as you get more experienced at looking at research, you know, you'll be able to tell whether, you know looking at the process of research, like, em, the recruitment strategy, looking at em you know how many sam... you know, how big a sample was it, you know. (Shannon)
#75 Research terminology is a barrier to understanding research and literature	...cos some that you look at and you're like I just don't even understand what that word means and you have to go somewhere else to look up what that word means and then go back to it and by the time you've done all that you're kind of like, I, I might just give up on this book. But em yeah terminology is a bit hard. (Jess)
#77 Uncertainty about level of research understanding and result of assignment	I was really surprised at my mark... I knew I'd written a reasonable essay but I was really surprised cos there was certain things in it I still didn't think I completely understood. But I must have convinced the person who marked it I understood it. So maybe I understood more than I think I do (Louise)
#78 Discomfort with reading or critiquing quantitative research	I just couldn't read the other one. it was too sort of mathematical and I just, I think I read half of the quantitative one and thought no, this isn't for me. I was just. I'm just, I'm not sort of very that minded with charts and I just found the other one a lot easier to sort of understand and read. (Kayleigh)

Appendix 10: Codes linked to trouble (7/7)

Appendix 10: Codes linked to trouble (7/7)

Code	Student quote
#79 Discomfort with reading or critiquing qualitative research	I think it [grounded theory] was quite a good, you know approach to use, but I don't know if, when I was looking at it, just kind of got the impression that she, em, added in her own wee bits. (Shannon)
#87 Facets of developing skills of self direction in study	I wasn't prepared for organising my time myself. I just I didn't know how to go about setting it. (Stuart)
#90 Learning from the module will not be useful for other essays	I don't know, I'm starting reading journals now for this next one so I don't know if maybe be in my head, might start thinking oh could've done that or but then you kind of think that you don't want that to come in to your head because if you're doing an essay about something completely different you don't want to analyse a journal at the same tie because it's nothing to do with what you're actual essay is about but I don't think it would make me read them any different. I think I would just take them at face value again. (Ruth)
#96 Student directly describes a liminal or tentative state	I think having the opportunity to do it again, maybe I'd understand it better. I'd have a better understanding of it yeah. I'd be able to feel more confident with it. Just all it had to be a bit rushed. (Abby)
#97 Expressions of a lack of interest or dislike of the module	I just I don't know they're just, it wasn't very interesting. It didn't really grip you. (Mandy)
#101 Student has not entered a liminal state	But the actual research bit, as I say, it's something we take on board anyway. It's something that's been preached into us from day one. so the actual research module. All it showed me really is how to critique and that's how to go through each area and question. (Ruth)

The End
